known, already makes image sto-rage systems that use CCD scanners for input and disc or magnetic tape to hold images, which are used mainly in specialist applications such as banking and engineuring. General manager George Numer thinks the new system could form the nucleus of an electronic office, particularly for special task groups in research organisations. civil engineering, or manufacturing where drawings are much used. It would probably have from

EMI Datel deal

EMI SE Labs has won a contract worth over £½ million to produce in quantity two types of wideband ncoder designed by British Telecom for its Datel 48K leased Type 35 is for installation in customer preinless at each end of the link and Type 36 is for British Teleconi's repeater stations.

Software addition

added to Ferranti's "alternative to the ICL 7502 and IBM 3270," the PT7 Programmable Terminal System. The addition is a File Haodling Terminal Package, FTP which builds on its predecessor, ITP Interactive Terminal Package, to give local disc handling with indexed sequential, random and serial files. It is aimed at such areas serial files. It is aimed at such areas
as order entry offices and stores.

The 35-megabyte capacity of the
1200 Series will provide an ideal

Viewdata is Plessey opener

with the development of a combined telephone and compact viewdata receiver, and the announcement that the telecommunications company's long-awnited plans for what it calls the integrated

with pictures ICL small system gets Winchesters

latest in small systems technology, ICL has signed a deal with images of documents and ordinary Micropolis of Chatsworth, Califoruia. From the heginning of next year Micropolis will be shipping its 1200 Series of 8-inch Winchester disc drives for incorporation within ICL's ME29 computer.

Launehed in March of this year, the ME29 spearheads ICL's effort to capture a portion of the small systems market. It has four basic storage options of which the Modulc 10 Winchester option is the smallest. The other modules, both fixed and exchangeable discs, are supplied in ICL by Control Data.

Marriage

The marriage of Winchester technology with the ME29 did not coincide with the ME29 Inuoch because, in the words of nir ICL spokesperson, "We hadn't fully analysed the Winchester market at

ili. I stage."

For all the broulinha generated by Winchesters such as the 1200 Series, Micropolis is still in the early stages of production, having numufactured 1,000 units to date. By the end of next year Micropolis expects to have cranked up to olume production quantities of A NEW software option has been 100 drives per day, and the ICL order should account for 10% of

> Both companies were involved in the interface work which involved changes in hardware and firmware. ICL has not specified how many of the drives it will be taking but the contract covers a

three-year period.

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IN a hid to link itself with the disc file system for the small user. Features of the drive include last access, halanced rotary voice coil positioner and an external spindle

hrake system. 14/4 follows up

of Empire (CW, October 2) and other financial modelling systems, comes the new FPS-80 relessed by RTZ Computer Services.

Like similar financial services it offers planners the opportunity to vary factors like net profit or eash flow, and assess the results.

Incorporated in the package are several facilities. DCF and NPV calculate respectively the discounted cash flow yield, and the net present value for specified discount rate.

Using Step any input data line can be varied by given percentage increments, while Target living up to its name can determine the input value needed to achieve a de-stred output figure. Hierarchical representation of results can be oduced by Structure, and the ensitivity facility allows change of any input data with printout of selected line.

FPS-80 can be used either through the RTZ Timesharing rretwork, or as an independent system via a dedicated maclune located at the user's own premises.

Petaid undated

Pilot installations of Plesscy's entry in the Office of the Future stakes are to start in

The viewdata set, known as Viewtel, is now complete in its design and Plessey is considering how to market it. Discussions are alsa heing held with British l'elecom about hnw it meets the quirements for Prestel.

A small screen, a handset, and a push-button dialling unit are all combined in one desk-top housing; the buttons are used both for dialling and communicating with the viewdata computer.

Later an alphabetic keyhoard and a small printer will he added,

ing considered as a possible feature. Repetitive dialling is already A mobile terminal intended for use in vehicles, using radio communications, liss also been developed. Called the Universal Mobile Communications Terminal, it switch. It will have to include text

Slow tions highly secure. It is intended for use by security cations and microelectronics have patrols in communicating with their bases and obtaining informa-

Managing director Des Pitcher said that Plessey might well expand this work into providing complete hardware and software systems for the police.

and slow-sean television is also beyear development work at Becstherefore take caus and still mainton, Notts, on an integrated office tain planned progress, he said. ystem is still not elear, but Pitcher affirms it will be hased on the 1979-80.

Virtual processor to bridge Univac gap

USERS of Univac 90 Systems can based on a logic bus atmentive and ook forward to a new processor multiprocessor environment of the

The big advantage of the AVP is that when configured into this system, user programs written for the VS/9 OS can be executed concurrently with applications for

H. Glen Haney, vice-president Univac, foresaw that most

designed to meet their growth 190/80 family of processors. Main 11 storage ranges from 524K to storage ranges from 524K to 1048K-wards, while a 32K-byte eache provides for buffering of intween the current VS/9 operating system and the Series 1100. First deliveries are scheduled for 1982.

The processor, the AVP 1100/60, is designed to operate in a multiprocessor are scheduled to PSZ.

microcode control similar to the

大Up-grade kit.

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Cash flow problems

MEGALEASING

tion from databanks. The Swedish last year, but cash flow problems police have already placed an led to inevitable cut-backs in a number of sectors, according to

puter facility at Rutherford had. fur tustance, developed more The outcome of Plessey's two-quickly than anticipated and could presenting the council's report for

partly a result of the recession we find ourselves in. We're tightly has a small screen, an alpha key-board, and special encryption editing and processing software, stretched across all our areas of which is a new venture for Plessey. activity, but we're confident that we'll be right back on course over

the next year or two."

About 23% of the council's budget had gone on the engineering sector with microelectronics getting between 35% and 40% of the amount. Asked why engineering hadn't got a bigger silce of the

"Indostry must put itself back offorts. What we can do is provide a lounching pad of prople and ideas for them to choose from." The council's gross expenditus for 1979-80 was £181,074,702.

Another product expected for some time and now officially un-veiled is Concurrent Machine En-

UP to three times the power and twice the pdee/performance of the existing ICL 2956 is offered by the existing ICL 2956 is offered by the 2966, one of two new 2900 series mainframes formslly launched by ICL as part of n msjor package of microcoded facility for running either of the VME also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also includes some of the extra operating systems concurrently on the same machine with DME. It employs the technique known as ICL as part of n msjor package of announcements also incl employs the technique known as time slieing (CW, April 17) and will be available on the 2946, 50, ICL as part of n msjor package of hardware and software announce-55, 56 and 66 but not the 2960. ments. As expected the other new . machine is the 2955. Its features will include support for TME, the ME29 transaction processing

Copyright furore

that never was

sion of the firmwere debugging and editing Toolkit for the Com-

modole Pet. Gary, who has been in hot water

before over price-cutting (CW, August 28) and marketing an

unauthorised cheaper version of Clive Sinclair's ZX80 (CW, June 12), received a letter from the soli-

ciors of Zynar, the Toolki'a distributors, on Friday. He repiled with a telex which agreed to abide by Zynar's requirements, adding: "In no way does this constitute an admission of wild!"

sdmission of guilt'.

Zynar was polsed to serve Company with an injunction on Monday when Gary's hasty compliance

Close eye

The Toolkit copy had come to their strention through the Pet newsletter Printout, and for some

made it unnecessary.

ANOTHER promising test of soft-ware copyright law has fizzled out before even reaching the courts. Chris Gary of Compshop in Barnet has given a voluntary undertaking not to market or distribute a ver-sion of the formula of the courts.

weeks Zynar kept a close eye on Companop.

Zynar obtained a copy of Companop's. Toolkit to establish whether or not it was pirated. A careful case against Companop was then pieced together, culminating in the solicitor's letter on Eriday.

The Toolkit is a firmware ROM:

it in the solicitor's letter on Eriday.

The Toolkit is a firmware ROM:

it is in the solicitor's letter on Eriday.

Turn to page 5

ICL wants 2960 users to move to the 2972 and away from DME. Along with CME, ICL is

offering a facility called Adram 1900 which enables VME programs to read and write data from 1900 DME files.

Amicable

micro market by financing Nestar Systems' Apple ClusterBus.

In an agreement by which Zynar undertook the exclusive marketing of Nestar products in West Burope (CW, August 2) Uxbridge-based Zynar acquire the Toolkit, which

had been a Petsoft top-seller.

Zynar's Colin Crock explained

Zynar's Colin Grook explained that he was trying to protect the company's investment in new developments as much as the existing Toolkit, which being implemented on ROM has always been vulnerable and low has company the company.

able to piracy, and now has compe-tition from other candidates for the

ACT Microsoft ceded the Tool-kit agency to Zynar in an anicable agreement earlier this year, after THE French government

Zynar's parent, multinational Rank, decided to move in on the micro market by financing Nestar pointed a new Minister for Telecommunications. He is Pierre Ribes, 61, a political science grad-

VME/B operating system called VME/B-E, and a new version of VME/K, KSV 18, which offers support for CME and the new IPA

the machine quietly introduced by ICL earlier this year. A 2946 can

£327m in micros

THE UK has committed the most

of all EEC countries to the support of microelectronics by investing

327 million for manufacturing

facilities, applications and educa-tion, according to an International Labour Organisation study. In total EEC members have com-

parliament since 1968

Personal push

JAPANESE exports of personal computers into EEC countries have risen from almost zero last

Computerview
Letters to the Editor
Azteo West' trade mission

ectition results....

UK invests

to build networks of ME29s Irnked to a 2955 with the help of IPA. ICL says that the 2955 offers about 20% more power than the

year. Already one company, Sord Computer Systems, has received a

warning from France to restrain its

exports, or restrictions could be

SIA Computer Services, the UK subsidiary of the French CISI Group, has bought a 75% shareholding in Rand Information Systems, A software and system conversion group, Rand has 30 cm.

8100 for Italians

THE IBM 8100 distributed

processing system is being used for applications being developed by two large Italian organisations — Alitsila, the national airline, and the social security organisation, Istituto Razionale Providenza Sociale (IHPS).

Control of Rand

The 2955 is based on the 2946, existing 2950/20 and quotes a price of £340,000 for a system with one be field upgraded to a 2955 with the addition of some extra

Turn to page 13

INSIDE THIS WEEK'S CW.,..

JOB OPPORTUNITIES: Pages 20-39

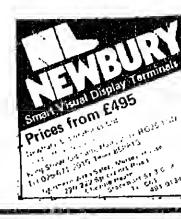
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PACKAGING AS ICL BOOSTS ITS MIDDLE RANGE

'No wires' production key to H-series profits

CHEAPER production from the price/performance improve-radical new packaging is the one ment over the 303X machines is the Hitachi M-200H, which IBM indication of IBM's anxiety to sell major innovation of the 3801, first member of the long-owaited H series from IBM. Announced on November 12, the date most favoured by IBM watchers (CW, October 26), the 3801 offers a performance well in exeess of 10 nul-

lion instructions per second using two tightly coupled processors. Ill M aims to maintain profits by slashing production costs through eliminating much of the wiring. It quotes £1.9 million for o 16 mega-

to reduce purchase prices on all 303X computers by around 20%, an indication that the smaller H series six mip H series mode will

Amdahl is reacting to the 3081 announcement by immediately un-veiling the new top end machine held under wraps in anticipation of the H series launch. Vendors of only 50% more than a 3031 while Turn to page 13

sors, may liave to revise their pric- the 3081 CPU, with two processors ing. But 3081 deliveries will not

that offers field upgradability to £625,000 for a four megabyic metres square and replaces a great

not as dramatic as that offered by the 4300 series over medium scale with two tightly coupled processors.

Can now match in power albeit off its stock of 3033 processors.

Apart from the dyadic design of

start until the fourth quarter of and operating system, the main next year.

1BM has also announced the packaging of more than 100 de-3033 Model Group S, an entry vices with a total of 45,000 circuit on a 33-layer ceramic substrate. vices with a total of 45,000 circuits The ehip carrying area of the the 3033 multi-processors. At substrate measures only nine centi-

High power upgrade for 2956 Racal Microsisatronic Systems ULA facility 'Close to ultimate' CMOS

venture in the pipeline EUROPE is to get its first source of the "close to ultimate" technology, oxide-isolated silicon gate CMOS, from a joint venture in the UK between Racal Microelec-

Silicon gate CMOS fentures extremely low power consumption and high speed of operation and is superior in performance to the more commonly used metal gate

At reduced dimensions, the technology is capable of producing

which could take preference over

both speed and density. With Racal's uncommitted logic array, ULA concept and specially developed computer-aided design equipment and packages, com-panies could eventually obtain eustom VLS1 silicon devices within a few days.

The two companies, working closely with the Leuven University R&D unit in Belgium, have al-

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change as you are. Before you take that important computer mance decision call Atlantic and find out why Flexiesse is quite simply a better way of acquiring computer power.

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COMPUTERVIEW

ICL holds the line

GIVEN the choice, ICL would no doubt very well" on a small scale level. But, it adds swap the BCS award pinned last week on its coolly: "We studied the results of the trial content addressable file store system for an very closely before asking the four com-nssurance that CAFS will be used fur the panies to put forward their proposals." next big public sector order in the offing this nne for British Telecom.

Office needs a high speed information retrie- battle on its hands for the potential multivel system for the UK telephone directory million contract, one apparently tailor-made ossistance service, Directory Inquiries.
It will be employed by 8,000 telephonists

mated one million inquiries per day.

An indication that it is involutite for the contract would allay ICL fears that British

The battle between these two, with GEC and CCI weighing in, is out in the cold contract would allay ICL fears that British l'elecom niny go for IBM, GEC or Computer Consultanta Incorporated, all of whose

equipment is under current review. already tried CAFS with a great deal of nationalised is not a government depart-

success at its Leeds and Leatherhead inquiiry centres. Trials ran there for a year from Navember 1978.

British Telecom stresses that it classe CAFS as a trial system, and is perfectly willing to point out to anyone interested enough to ask that "it did uideed perform In truth, this is only what the concerned

taxpayer would expect from a public body. The telecommunications arm of the Post But it is clear that ICL has another major

wall be employed by 8,000 telephonists working in 260 inquiry centres all over the country serving Britain's 17 million telephone users. The centres deal with an estimated one million inquiries not described.

tered by single-tender order policies and the like. The policy is soon to run out, but does This is despite the fact that Telecom has mainframe and British Telecom, though

The outcome of the battle will be a better icst than the BCS award testifying to ICL's

Copyright law

COPYRIGHT, the author's ownership of his work, is something that can be bought, sold - or atolen. While writing and recording rights are clearly protected, the law liss not yet caught up with the technicalities of software ownership, despite repeated calls from the industry.

Industry observers were hoping that Zynar, backed by Rank's cash resources, ild get into court with a case which would settle for once and for all the indisunct copyright law on software. But Chris Gary, who would otherwise have found himself the subject of an injunc-

tion, has given an undertaking to stop

selbing what is alleged to be a copy of Zy-

nar's Toolkit, a firmware utility for Commo-

dore Pet programmers which plugs in on one of the Pet's spare socketa. The Toolkit's implementation on ROM makes it particularly vulnerable to piracy, a disadvantage not helped by the recent Sin-

clair case against Compshop, in which will Justice Megarry implied that ROM, kee, invisible, civild not be considered to copyrightable.

Zynar took the precaution of building: a case on several grounds; since the shifter sands of software copyright make for a deal erous path to be picked out between adda judgments.
Other recent litigants have also hedge

their bets; Sinclair won his injunction on the similarity of keyboard, and Graham Down Software is currently pursuing an align theft of source code on the grounds of "or spiracy to defraud".

However, the Kansas City System or

recently indicated a change of heart by the law: although settled out of coun the cre did get as far as an injunction, given h Justice Graham on the grounds that softan copyright was infringed.

The implication that there is such rig-protecting software is encouraging, a it? nar'a assertion of rights over the Took But it is not enough; it is high time the pris of the law was given substance by the letter of it, either through a decisive case or he ter, through a specifically worded Bill he protect the British software industry.

LETTERS to the EDITOR

growth of employment opportuni-ties in Wales be achieved through

differing uses of new technology

Such a declaration is of direct rele-

vance to the recently announced

decision to site the first Inmos fac-

tory at Newport, Gwent. But, in recognition of possible difficulties

consequent to uneven de-

velopmenta due to new tech-

nology, Plaid Cymrit advocates

"the sharing of wealth produced

by new technological processes on the widest possible scale and its use to create socially desirable jobs, in improving the environ-

Plaid Cymru alternative

'THE CW Recruitment Special employment, the conference de-(October 30, 1980) provided room manded that "the maximum for Tory, Labour and Liberal Party views on developments in the computer industry.

It might interest you to know that there are other political partles in Britain, and indeed parties with perliamentary representation, which have considered policies on

This year Plaid Cymru devoted its annual summer school to the twin isoues of energy and new technology. Lectures explaining the implications of growth in new technology were given by a number of invited guests. Mem-bers of Plaid Cymru have indicated that it is necessary to make a posi-

tive response to the challenge of new technology.

Plaid Cymru is deeply con-cerned with the horrific decline in employment opportunities which has occurred in Wales due to the axing of jobs in traditional and basic industries. At its annual con-ference on October 22-25, Plaid Cymru declared its strong opposi-tion to the policies of the present overnment but also stried clearly te position on the question of new

In a comprehensive motion on

replies

McLellsn Inglet on Impetient mightspretation in their letter (CW, October 91 regsrding my column of September 11, which introduced the eimplification

principles I have bean treeting.
First, I must object that their interpretations of the principles intentionally lasve out the distinctions which era clearly in my list. Of coursa all "almpitication" principles asy "almpity" in one way or another. In summarising the principles of aimpitifeation before treating them in depth, I racognised that some readers would "misunderstand the principlee" ICW, September 11) and wernad of this at the time. I still feel that there was some sarvice in the there was some sarvice to the reader, particularly if the series oollacted, in giving this

ment and developing housing education, health and social ser-I would hops that Unthwalta and MoLelisn heve the grace to feal embarrassed shout their public outburst, end went to do I hope that the seriousness with which Plaid Cymru approachea the subject of new technology is ua all a more constructive serus all a more constructive service by making specific references to the principles 1 have expounded; they are not inisitible but are marely practical observations from my limited point of view. Or perhaps they can contribute come principles and expaniances in simplification. apparent from the preceding remarks. In these days of growth in information technology, it is to be hoped that there will be a much wider access to political Ideas and

Dr K. ALAN SHORE Penyffordd,

Tom Gilb Turing test of info creation UNTHWAITE and A. J. A.

IT seems that a debate has been started on whether or not a computer can create information (Michie's Privateview, CW, October

I propose a kittd of Turing test. Let us take three cables, leading to three printers. At the other ends uf the cables we put Professor Michie, a computer with a pseudorandom number generator, and n truly random source of white noise (based on thermal noise or random

formation produced by these the sources and displayed on the pris My prediction is that the white noise source will "create" the most information, the computer w come a close second, and the

hours, or days, we observe the in

Professor a clear third. C. G. PERROTT

Taxing systems

'MICROCOMPUTERS in every tax office" (CW, November 6) is only one of the options we discuss in our pamphlet on the computeri-action of PAYE assessment. The final tecommendation is better described as a mixture of small to medium-sized businese systems using the staff, accommodation and communications facilities which the Inland Revenue already have, or can reesonably be ex-pected to obtain in a sensible time-

Since the key arguments will ap-ply with equal force to a number of major government computer proposals likely over the next few years, I should like to remind your

readers that copies of the full h are now available, price 12.9, from the Bow Group, 240 High Holborn, London, WCIV 7DT. should also like to poist out the arrangements can be made h counter-arguments to be circulate to the full membership of the Group, including 22 government. Miniaters (eight of whom are to Cabinet rank), and 62 ln the Hou of Commons. PHILIP VIRGO

The Bow Group

TEN YEARS AG0

From Computer Weekly of November 19, 1970

of November 18, 1970

ICL. Control Dets and Cli of France egreed to term a joint study company based in Selection, to be called international glum, to be called international glum, to be called international part of the company of the continuous of the co

Trade mission out to sell 'Aztec West' to the Americans TARING coals to Newcastle? A rishes best where facilities for the space and 500,000 square feet of source of skilled engineering staff. However West remains optimism

this month to promote Silicon villes. With scope for growth.

Development is expected to take less thrown as Azter West. The aim of this trade mission is to attract limiter US mission is to attract limiter. US mission is to attract limiter us site and bought the lend in 1970 mission is the attract limiter. Site and bought the lend in 1970 mission is to attract limiter. US site and bought the lend in 1970 mission is to attract limiter. US site and bought the lend in 1970 mission is to attract limiter. US site and bought the lend in 1970 mission is to attract limiter. US companies," he said, welcome one of the most important high technical supply industry, recognises the potential of the Bristol in 1970 mission is to attract limiter. US companies and bought the lend in 1970 mission is to attract limiter. US companies are likely to move into the area of the most important high technical supply industry. The said, welcome one of the most important high technical supply industry. The said, welcome one of the most important high technical supply industry. The said, welcome one of the most important high technical supply industry. The said, welcome one of the most important high technical supply industry. The said, welcome one of the most important high technical supply industry. The said is the most important high technical supply industry are supply industry. The said is the most important high technical supply industry are supply industry. The said is the most important high technical supply industry are supply industry. The said is the most important high technical supply industry are supply industry. The said is the most important high technical supply industry are supply industry. this month to promote Silicon Val- with scope for growth, mission is to attract the 200-acre desite and bought the land in 1979. Indogy computes in the world, area, admitted that manufacturing shortly."

Construction is on the modular Bristol is particularly well saired judg have been cut from 30% of the During the last year several price of the design dopment site near Ilristol.

relopment site near tiristot.

Aziec, derived from the A to Z of technology, flowered from research carried out worldwide showing that high technology flour million square feet of industrial million square feet

strong entry to

cluding an 80 clips 132-column

slinot of Trivector Systems, a six-

year-old Bedfordslure company

which has been manufacturing

microcomputers for scientific ap-

plications. The new company has been financed partly by TC and partly by a £100,000 loan from Barelay's Merchant Bank.

Trivector Commerce is an off-

onder an agreement with the US Production of the chip will take place at Telefunken's electronic

component plant in Heilbronn, a small town just outside Stuttgart.

ager for Mostek Europe, said: "The 3870 is of our own design and we entered the agreenient with AlfG Telefunken so that our Entopean customers will have a second source of supply."

to manufacture the Fairchild F8

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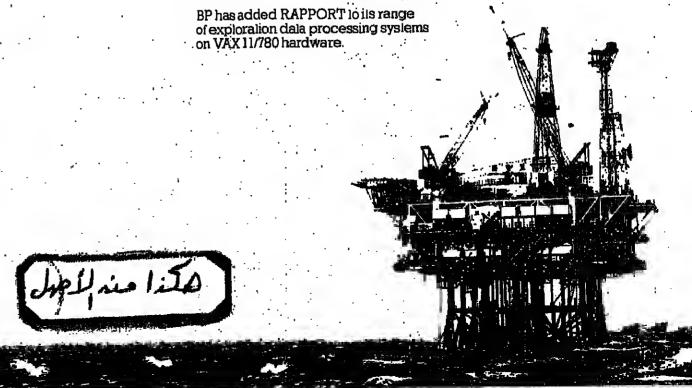
lo answer casual queries and produce simple reports. RAPPORT gives these comprehensive

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have been extremely frustrating written to 97 DP managers), and and fruitless in securing the start. "st least 12 months' experience" and "We will train you in further

which I need in the industry.
TOPS atudenta, who are often featured in articles in all computer magazines, are often under-rated in their abilities and dedication to secure a career in this industry. Yes, there are those who have commenced the course to obtain that little extra money which la offered as an inducement to leave the dole queue for a few months, but in my experience many are people who have left secure em-playment through frustration or the realisation that programming is within their enpablishes after all.

l am 33, married with one son of 20 months and was educated at a grammar school. I did not ait any GCEa as I joined the Army at 16.

NOT only is it the young people like Gulwant Deol (CW, October 30) who find entry into data processing difficult. My own experiences of like past few months the periences of like past few months the computer User's Year Book (I have recently the contaction of the past few months and the contact of the past few months are accounted to a course in Cobol to City & Guilds and and a five month A/P training course in Liverpool.

I enjoyed it immensely but when it drew to a close, only 50% of the past few months are accounted to a course in Cobol to City & Guilds and and and a five month A/P training course in Liverpool.

I like, many other TOPS students had obtained to be a close, only 50% of the course in Cobol to City & Guilds and and a five month A/P training and and and a close in Liverpool.

I like, many other TOPS students had obtained to be a close, only 50% of the course in Cobol to City & Guilds and and a five month A/P training and a course in Cobol to City & Guilds and a five month A/P training and a course in Cobol to City & Guilds and a five month A/P training and and a close, only 50% of the course in Cobol to City & Guilds and a five month A/P training and a course in Cobol to City & Guilds and a five month A/P training and a close, only 50% of the course in Cobol to City & Guilds and a five month A/P training and a close, only 50% of the course in Cobol to City & Guilds and a close, only 50% of the course in Cobol to City & Guilds and and a close, only 50% of the course in Cobol to City & Guilds and a close, only 50% of the course in Cobol to City & Guilds and and a close, only 50% of the course in Cobol to City & Guilds and a close, only 50% of the course in Cobol to City & Guilds and a close, only 50% of the course in Cobol to City & Guilds and a close, only 50% of the course in Cobol to City & Guilds and a close, only 50% of the course in Cobol to City & Guilds and a close, only 50% of the course in Cobol to City & Guilds and a close, only 50% of the course in Cobol to City & Guilds and a close, on answering adverts which ask for

> languages" Although we can program, who will help us further with our first have lectured to both TOPS and language?

As an ex-TOPS andent, I have 3 months' experience of RPG II on IBM 4331. DOS/VSE and 6 months of Basie on Northstar Horizon micro DOS, I can understand and program from specifica-tions, but I haven't that 12 months' experience.

atudents had obtained jobs. The company which trained me was sufficiently impressed by my performance to offer me a position as a trainee consultant (lecturer)

YOPS students. career within the commercial field and so registered with 24, yes 24

After three months I have still had no response. I continue to write for jobs which require 12 months' experience, and am abortly due to start a home study Liverponl

dents, am relocatable and, in apite of a lack of formal quelifications, am completely capable of a good performance: So come on, employers . . . give us a chance to prove our-

selves, you won't regret it as we'll put that little bit of extra effort into our work.

If any employers have vacancies it won't coat you anything but a little time, and could benefit your

company. PETER A. BALL Gataacre

1984 and all that

THIS week's example of the strange things people say in the media about computers was seet in by D. Boyd of Norwich, who wins £5. Times Newspapers; management, after prolonged disruption, informed print union issiders that uhiass agreement was reached on introduction of new technology — affectively the use of video screen computer terminology by journalists and advertising staff, as well as by NGA operators—but also important reforms in industrial relations, publication of all papers would be suspended by the end of November that year.

The Daily Telegraph

to multi-tasking operation. A common problem with small business systems which have been extended for muld-tasking is the drop in response time. Trivector's Triton 4 obviates this by providing the facility to add on up to three additional CPU modules. Alternatively, if response

microcomputer market. The com-

pany's first machine incorporating 64K RAM and 22 negabytes of

backing sture on Winchester disc,

is particularly suitable for expan-

time is not an important feature but cost ia, then jobs ean be run on a time-shared basis with up to four VDUs connected to a single com-

mon processor.

Each VDU controller incorporates 32K of memory addressable

BOS.

CTL into the ICE age TOO small to impose its own net-working philosophy on its users Computer Technology is hoping to expand its customer base by

offering support for just about any kind of communications method. That support takes the form of ICE, Intelligent Communications Environment, a hardware/software package that includes a box called the 8680 containing up to 16 independent front end processors and a provide at asynchronous, synchro-ligh level processors and a nous, SDLC, HDLC or parallel high level protocol development language called Class.

ICE, which took two and a half years to develop, relieves a CTL 8000 series host computer of any communications processing workload. All code for communications handling has been re-moved from CTL's Modus operat-

ag system. Called Character Level Proces-

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business micro market

available in store as apposed to

of the Winchester by a 12-mega-

byte carridge tape. Only two tapes are needed to dump the entire contents of the Winehester, a

process which takes about 25 min-

utes. This compares favourably

with systems which have to fall

back on a large number of floppy

discs for security back-up. The 22

megabyte memory can be in-creased in steps up to 128 mega-

any general purpose Z80 software,

but main software support is through CAP's MicroCobol under

the Business Operating System,

68B09 chip which supports 16-bit

Using ita own tnulti-tasking executive, each CLP handles all

I/O functions essociated with at-

teched lines and devices. It can

interface for direct connection or

through a modem and the full

complement of 16 CLPs in an 8680

can support up to 64 lines. Up to four 8680s can be supported by a CTL 8000 using host resident Block Level Processors.

Each 8680 will add between

£9,000 and £35,000 to the cost of a

complete CTL system.

The Triton 4 may be used with

Another feature is the back-up

having to be loaded by disc.

Development is expected to take manufacturing plant to South creation of 3,000 jobs over the next

The recent loss of the furnos and firmly expects to see the

Mostek WEST Tierman electrical and

electronic components group AEG Telefunken, is to produce the Mostek 3870 eight-bit micropro-cessor for the furopean market

AEG signs

licensing

deal with

Volkmar Schaldach, sales man-

The patent agreement with Mostek comes as a fillip for Telefiniken, which got imo financial problems last year and had to horrow funds from several banks. Mosick has patent agreements

eight-bit microprocessor, Zilog'o ZB and Intel's 16-bit micro, the Chris Blake, of Trivector Commerca demonstrateo Triton 4 at its lounch et

It runs on IBM, ICL, DEC, Univac.

'Powerful indexing mechanism gives fasl retrieval from any RAPPORT database lile by any key.

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(Unfortunately, I stayed only six months.) After thus I apent the next few years in various jobs, always satisfying my employers.

My last 10 years have been apent in a production environment where; through hard work and several promptions over the last. Itself a pusy factory.

However, I wish to pursue a

Wrong

THIS year's president of the British Computer Society, Mr F. J. Honper, has confided that he is worried technology is outstripping the capability of people to cope with its application with the degree of confidence and ability which the Ordinary Man on the Clapham Omnibus has been led to expect. There is a chance, however, that Hooper and the BCS have been

travelling on the wrong hus. The ability of the non-DP professional to absorb computing technology is a confirmed fact of life. Just who was it who operated the original desk-top accounting unchines and minicomputers Who now unenues the small busi ness machines and the hordes of Mighty Micros being introduced into nun-DP specialist cuviron-

As the BCS will recoll from their earlier involvement in microfairs. far from being hesitant or refuetant to grapple with new technology, society of large appears only too eager to get to grips with computers. Interested parties at such gatherings range from schoolchildren to the enthusiastic businessman, plus not a few hobbyists. The BCS should perhops take a closer look at the office desk. Chances are that each individual is coping with his terminal, VDU or ... WHERE EVERY PROSPECT micro with considerable confi dence and ability.

Pace

Hooper went on to suggest that the ultimate emergence of an electronic environment such as the automated office is fraught with danger. Wilether office workers see the inherent dongers in the same electronic light is far from certain. Given the choice of manual ledger accounting, cumbetsome filing systems and typing comprehensive legal documents, few would domir at the introduce tion of a micro, an electronic mailbox or a word processor unit into

The BCS is not, however, alone in its approach. The NCC has announced that it is to conduct a study to investigate the effects of the new technology on managers jobs. Maybe there abould be a public work-in seminar to reassure the leaders of the computer industry that, far from being uneasy, the average citizen is more concerned with the pace of his Clapham Omi-bus than the pace of DP tech-

Oh for the quiet life!

OFTEN wonder about this amazing inicroelectronic world of the future we keep hearing about. Everything will work Road, where there is a glittering array of such devices, and choose one, a GMTC nindel, which is described as "computer beautifully and there will be nothing left for us 10 do, or so we are told. Then I go controlled" and is in fact very clever. out into the world and try and do some-It is highly automatic: it does all the thing with electronics, and I start thinking

HOW PLEASANT 'TIS TO

...AND ONLY MAN IS ...

even call in from another phone and make certainly don't live here. My latest saga goes as fullows: I decided play back your messages to you. Great! So I take it home and there it is, would be luce to have a telephone oninstalled by the phone in my study/ plaining that I am never in to answer the hone and I convince myself that I am

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maybe the forecasters live on Mars - they

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Don's mind wonderfully, end

results in £50 end the signed

guing to T. Loudon, institute of Geological Sciencea, who lives

In Selerno, Midfothlan

OO

BINARY

CHOP

October 28) exercised

PLEASES...

There the problem appears. I discover

thinking and fiddling for you and you can

missing lots of exciting party invitations. So I trundle down the Tottenham Court Road, where there is a glittering array of This noise is inaudible in a crowded shop, but at home it is enough to drive you bananas, while you are sitting at your desk trying to work or lying in bed trying to

> So what do I do? I switch it off. Then I go out, forgetting to switch it on again. Or I go to the loo, thinking it will answer the phone and of course it doesn't. Cleorly the whole idea is to lcave it on all the time; that way you can decide to be anti-social and not answer the phone for a while even

I go screaming up the wall at the idea that this nucrochip can do all these clear things, but not make it quict! How could! have thought of this requirement for si-lence before I bought it? The manufac turer apparently didn't: my machine has

Downtime by Chad

All these machines make the poise to a greater or lesser extent. So what can be done? Will Chod be granted a happyisse out of oil his offlicuons?

Wait breathlessly with me to see, dear

want to use to match against ye

that the online terminal operat

can be allowed to use his or h

common sense to select a few to

will oormally be more succession

The operator can be given a depart

match against a single might

The third principle is the

access be by means of an operator

from the name are used to see (1/900th of file) a "page" of sele-cribers with similar sames. The,

stage two, the next two sights

are used to select one or a feet

the subscribers on that "and (for example "GI") page: Finally

character (very exceptionally (

is used to select, if at all necessit

A fourth hidden principle that the design here uses information which is natural for the applications (the name and address the or delivered to, which the paper or delivered to, which the paper than the paper of t

and the subscriber must porme,

is a matter of your priorite

Hypothesis: Systems of

the most?

More perfect

eye scanning a page. . In addition to these mile

The aecond principle it the of

GILB'S MYTHODOLOGY

Simplify by using two solutions

PURVEYORS ferent problems with a single mechanism or solution.

cation will often lead to hidden after initial implementations have performed poorly in actual operation, are necessary because of the cooflict involved in trying to satlafy widely different needs with a

For the masses

The way to ochieve real total simplification is often to have two more mechanisms; one for each f the widely varying problems.

I sometimes state this design principle as: Design for the masses, then design exception solutions for the exceptions.

Here is an example: A Swedish

newspaper designed a way of uni-quely identifying a subscriber for telephone loquiry into questions like; "Why didn't I get my paper

They had well over 100,000 subscribers to coosider, including lots of Olssons.

Some of you would have de-aigned a "subscriber number" of digita, conveniently ignoring the problem of the subscribet actually

SOME problem solutions become unoecessarily complicated because we attempt to solve extremely difsubscriber record by means of name and address, but most would have required a minimum of eight and probably many more characters keyed in, in order uniquely to

que characters from this information. JO MA (jones main) in ilkely to select well, while P. Il identify the subscriber. I am oot just guessing at these answers. I hove asked a few hundted course participants to solve this problem. Few of us would have come up with the elegantly simple and efficient soluof freedom. We don't have to

don't have to access records we average identifier keying of shout 4.2 choracters. Fruir characters for quely by electronic logic alone il "massea" of inquiries, and a fifth depression for exceptions (about 20%). Before you read on, you might like to take a guess at how this was accomplished. selection principles, notice to three-atage rocket; two chances

The solution uses a three stage rocket, combined with some natural selection of unique iden-

First, If the subscriber identified himself as Tom Gilb from Kolmeric characters (roughly 40 x combinations, or ot best apolin division into 1/1600 possibilità) botn, the online terminal operator would key in something like GI KO. This would give either a uni-que record, or at least the correct record in a list of almilar records on the screen (like a page of Gilba and Gilberts in a telephone catalogue). Visual operator eye in order to answer the enquiry, aclection can at this stoge answer unique subscriber record.

many questions, like: We have stopped delivery because oo

payment has been received. 'Each subscriber on the page'is assigned a unique one-character code, and a fifth key depression gives the unique record selection and full record display, which is

There are some hidden prin-ciples io this solution. The first is that people calling a large that people calling a large work process at both end of oewspaper will normally try to give an identification which will be inique at that institution, if my name is Jones on Main Street, then know that I must stress that I am made more perfect if we don't to make them completely pri Percival C. Jones on 234 Main Street (the operator might key PJ

NEWSPAPER TERMINAL

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Toshiba launches Russians catching up with 16-bit SOS micro US in microelectronics FROM behind the Iron Curtain It seems that new photolic by Videoton, a

announced a 16-bit microprocessor based on silicon-on-sapphire technology. This means that both GEC and Toshiba ore continuing re-search and development in SOS, even though Hewlett-Packard, the only manufacturer previously to have concentrated in the area, has opted out of advanced research (CW, September 18 and October

The T88000 uses a IOMHz clock with gate delays of around 0.7 nanoseconds and operates five times faster than MOS processors

of 2 microns would be needed to achieve the same sort of speed.

The device has about 12,000 gntes, and with the bigger line widths, the whole chip area is larger than normal, around 50mm². Speed is not the only advantage that SOS has over bulk like the Intel 8086 and Zilog's o quarter of that of a similar bulk 28000. The high speed is obtained silicon device, about 700mW.

With MOS techniques line widths the processing speed twice that of a single bus and the T88000 has a pipelining ahility, which also speeds up processing. While one instruction is being executed, another is fetched, thus saving

> put/output structure and the T88000 con address directly 16 megabytes. A 16-bit by 16-bit hardware multiplier increases the execution speed of multiplication to around 1.6 microseconds, or four machine cycles. This compares with up to 100 machine cy-eles for software multiplication.

which, at the most, is only sign and production of microelectronics. The gap was thought to be at least ten vears.

Control Data in the US has oblained through Hungarlan sources a Soviet micropro-The data bus has a 32-bit inessor similar to the intol 3080A 8-hit single chip nicrocomputar. Experts Control Data say that the Soviet davice, the K5801K80,77, is a genuine production device probably using the Intel

• From front page

put up with that sort of rip-off. This situation is very bad for the

UK software industry -it's disad-

rantageous to the development of

Chris Cary is away in Ireland for two weeks, but a spokeswoman for

The copyright furore

developed, as experts say the ling willths are larger than on the Intel chip. This is thought to have been done at Zeleno grad, 90 miles north-east of Moscow, known as the "Siticon Valley of Russio."

Tha Russians heve also used more robust packaging indicating the harsher industriel environment in which thèir microprocessors are used. The device is housed in e stronger, more relieble ceramic flat pack.

The Intel 8080As wars bought legally from Munich

Compshop said: "We've stopped

selling it after we had a note from

She stared that Compshop had

to go to onother source - "I haveo't a clue who the supplier

was" -- after they were unable to

buy the Toolkit from ACT

which has had a longstanding trading relationship with Control Data. The company specialises in producing data terminals for the Sovia Riad line of computers.

Videoton indicated to Control Data that if and when it decided to put the terminals into production it would not use the Intel part, but a Soviet copy of it. It then gave Control Data a sample.

Sovial computer output lost year was thought to be worth bout \$6 billion. This is the alza of the US computar industry without IBM.

Council dispute

THE dispute of Tyne and Wear Council, where Nalgo is pushing for a new technology agreement, is to go hefore the North Eastern Provincial Council, a joint unionemployer negotiating body. As re-ported last week, Nalgo is refusing o let its members operate a Bitsy word processor installed in the Tyne and Wear Architects' De-

TELECOMMUNICATIONS USERS' FIRST CONFERENCE

'Information technology vital if UK industry is to compete'—warning

IF UK industry is to keep up with its competitors abroad, it must cut office overheads by investing in ioformation technology, the Telecommunications Users' Association heard last
Speaking at the TUA's first conference, British Telecom deputy had been reduced from 125,000 in

Ing telecommuto ications was enormous and the Germans. Swedes.

now 10 months, but it was planned mous and the Germans, Swedes, French and Americans had seen this already. It was a disgrace, he said, that more people did not know about electronic offices.

United

British Telecom was not an enciny to users. Harper said it was a servant which did not feed shareholders but tried to optimise the running and finances of a network which belonged to the community. Any excessive profits were re-The new situation created by

Impending legislation on the mo-nopoly united more than it divided Builsh Telecom and its users, and the package of services being propared would create a need for co-operation rather than for de-

The government had approved 85% of BT's Investment requirements for this year, replacement of Strowger exchanges in London was hallway through, and walting lists for the supply of private lines

tumed down and now stood at proaches to CEPT, the committee 21,570. Exchange lines waiting of European PTTs.

managing director John Harper May to 108,000 now, and telex said that the potential for exploitto reduce it to three months by next Septembet.

Many delegates were worried about the thriving trade in illicit telephone attachments now going on, Harper said British Telecom had soft-pedalled its response so as not to appear to oppose the ending of the monopoly.

When a subscriber had been found using one, for example when it caused a fault on the line, he had been informed it was not a permitted strachment and usually he disconnected it voluntatily. If the subscriber told the engineer to "get stuffed," the policy was now to disconnect his line.

Danger

The biggest single danget to the revenues of PTTa in all countries was from the carriage by private internationally. There was concern about this up to CCITT level, Harper said.

Department of Industry tele-communications head Bill Wigthe first time in many years.

Private circuits on order had private circuits on order had been reduced by the said international services were subject to international servi peaked in August, but had then agreement and he knew of no ap-

Telecoms trading is discussed

TALKS have begun with the EEC Commission and foreign governducts and services wheo British ecom's monopoly is ended.

Dealing the Telecommunities of the London Business School, has the London Business School, has products and services wheo British Telecom's monopoly is ended.

ions Users' Association conference, the new Information Tech-hology Minister, Adam Butler, said that the GATT agreement and the REC regulations on free trade hould allow scope for reciprocal trading agreements. imports would not be en-

ouraged where there was no reciprocal arrangement; the government was not throwing open the gates to international manufactur-ing competition in one doctrinal gestion

The government's aims in dealing with the monopoly were to ensure the best possible relecommunications service to business and the general public and to stimulate industry to exploit to the full the confortunities presented by mulate industry to exploit to the full the opportunities presented by information i technology. It 'supported British Telecom's plans to invest heavily, since its network was fundamental to the continued stown of information technology. There might be some scope for

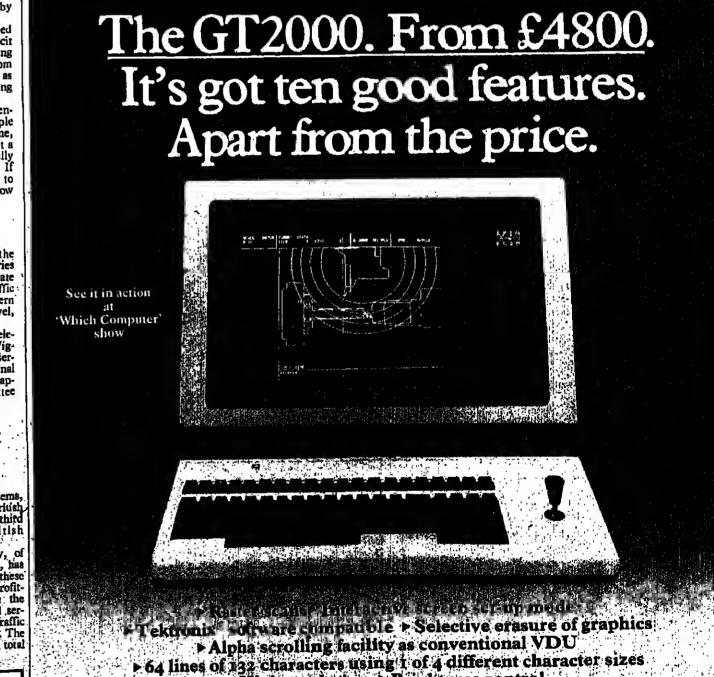
S227 1 Wales

competing transmission syste for resale of capacity on British Telecom's networks and for third

been commissioned to study these issues, because although profit-skimming might undermine the preservation of a widespread service, a rapid increase in traffic might justify the competition. The oretical maximum was total

Construction service

CMG (West End) has formed a division to deal with com-puter services for the build-ing and construction industry. The division's sarvices will include assistance with selection of computers, the acilities and the development of specialist



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PROGRAMMERS' PAGE

by Pamela Rowe

ppp

nm.

Brain-teasers—human v. computer approach

THERE'S this tall office building the ground floor by the lift, stand three anxious programmers and three representatives of manage-

They are hoving talks about possible redundancies which have to he director's office on the eighth floor. The only way to get there is by the nuclent lift which will carry two persons max, and needs a minimum of one to operate it.

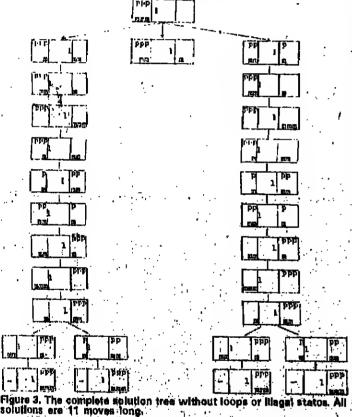
Series

Company rules state that il munagement nutnumber the prugrammers at any time, either un the ground or the eighth floor, the programmers will be made redundant, and whichever floor the lift is on, its passengers are counted as being on that floor. The task is tu get all six people up to the eighth floor in the smallest number of lift juurneys and with no redundanskywards and back to avoid their fate, or have you consigned them to redundancy with a slirug?

Problem salving is integral to the job of programmer or analyst, and is a great part of the attraction. There are almost as many ways uf reaching the final solution as there are people, and this week Pro-grammers' Page starts a series on types of problems, the approaches that different people use, end the rnute the computer takes tu the

gramming lunguage - not Cobol or Basic.

Meanwhile, back at the liftsheft, there is one mistoken as-



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A first look is at the brain-

teaser, and future weeks will contime with board games such as chesa, universal problem-solvers of whileh the main two are heuristics and means-end onalysis, and finally turn to artificial Intelligence techniques for a kit of problemsolving tools in the form uf a pro-

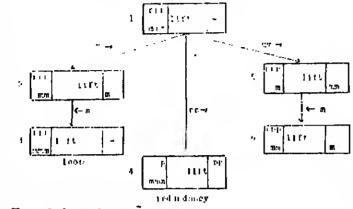


Figura 2. A search tree.

One approach is the good old trial-and-error, and using it you nusy end up in one of several cituations. In two lift journeys you could end up with two management reps and one programmet on the eighth floot and redundancy ringing down the cotridors, or you may get into a loop where the only aveiloble move hrings you back to the original state (see Figure 1). Talks reach deadlock!

Alternatively, in your shuttling back and forth you may have successfully lifted two managers and two programmers to the eighth floor, but are now stuck. Sending two back - one would result in an illegal situation — goes against the grain and intuitively feela like a retrograde step. It looks auspiciously like another loop. Any of these situations involves

back-tracking and undoing some previous moves in order to try new ones. In strategie terms this is a "search tree" (see Figure 2).

The tree is grown, and shaped, by the particular strategy used to

aumption which will prevent you reaching a final solution. Have you spotted it?

seek the solution. Humans employ a variety of ways, including trial and error and intuitive guesswork. and error and intuitive guesswork. Computers preferentially would be directed to one of two strategies the depth-first or the breadth-first

In the depth-first search, each pathway is explored to its bitter end. The search is essentially a plod through each path, completing one before turning to the next.

A computer working eyetemati-cally to stave off redundancy follows a hierarchy of moves. It will keep trying the first move until this fails and it is forced to adopt the next alternative. Once this has been made and a new problem state produced, the search returns

Programmed with a hierarchy of lin, 2p, 2m, 1plm, 1p, the computer sets off at node 1 by extracting one management rep but detects by a loop-check the dead end of oode 3. It backs up the search to node 2 for an alternative, but none

Another backtrack to node 1 results in lift-off for two pro-grammers but leads to redundancy notices on the ground floor, so back to square (node) I again for the third hierarchical move, 2m. This seems to work and allows the hierarchy to start again, eventually producing a loop at node 7, an illegal state at node 8, and signs of

Shortest

breakthrough at node 10.

lift

Redundancy:

In the complete search tree (see Figure 3) there are four possible solutions, and each can be reached ia a minimum of 11 moves.

The strategy has certainly got ua there, but is it the shortest solun, or is the lift burning up the ahaft? Short of growing the whole tree and comparing paths, there is no guarantee that it is the best. The breadth-first search accom-

modates this by looking at all solu-tions aimultaneously. All the atates reached by one move are grown, then all those by two moves, by three moves, etc. The first solution found is bound to be the shortest, though not necessarily of the same pattern as the depth-first

One more variation is the backwards search, working back along the pathways from the final solution. This guarantees that any path followed is not a dead-end or a loop. However, in practice the answer is not always known beforehand, and in theoretical terms not all pathways lead back to the original state. A backwards tree for moving the

band of six from the ground to the eighth floor would be exactly equi-valent to the forwards tree for moving same from eighth to ground. So "backing down" gets the programmers nowhere.

omputers are excellent of solving this sott of problem. While a human is still herding the first two

people into the lift the computer has the whole lot nearly packed up in the director's office, without whisper of the word redundancy

Loop

lift

The difference is in memory capacity. Having eliminated branches leading to loops or alked states, the computer can follow each path exhaustively to its end Humans, having limited memories, find it difficult to kep track of all moves down even ou path, or to foresee where a more may lead them, so are advised to

Strictly speaking, they do no follow either a depth-first or t bresdth-first atrategy but tend to concentrate on lengthening r single path, chosen by hugh, which they are often reluctant to

At one point in the problem 2m, 2p, and the lift are on the eighth floor, leaving lp and lm a the bottom. Gut feeling would the you that having got four people upstairs it would be a pity, and probably counter-productive, to bring two down again, back to c previous state. An assumption is made on past experience and the move discarded

It is, in fact, a vital move. The important difference is that the lift ends not on the eighth floor buten

Brain-teasers and trick problems are characteristically similar a more common problems but we tain a twist that makes the und solving techniques inappropriet. So hunches that would normally work, are liable to lead us astray.

Some humans make the fair assumption in the redundant problem, and refuse to take the retrograde seeming atep. Hence they fall to find a solution.

The computer has no such in

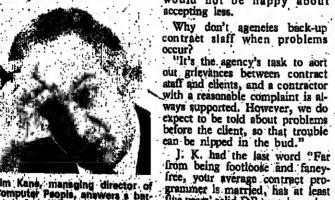
Agents have a point of view too

ARI you thinking of turning contract; despite the gloomy times? If so you may have pondered on some of the questions put the and answered by Ilm Kane, managing director of Computer People, one of the VLI Group of recrultment contpanies.

The most aften posed question - why don't agencies pay higher fees and rake off less commission? Said Kane, "Ninhody loves an agent: It's a question of running costs, for Instance to cover a weekly payroll whether or not the cileot has settled his bill. Contract staff are also protected against the olient going bust the lagency bears the expense "Also, why no holidity pay?" Sometimes a bonus is given at

the end of a contract as a not of holiday pay, but invariably the weakly rate is lower. Most contrac-tors seem to prefer the highest rate

the contract worker is capable of doing the kind of job that often arises as an emergency. There is no time for on-site training so It is beltet to be over- tather than uader-qualified. A contractor on his side can always find out about the level of the job and turn it down if



Why don't the agencies run training schemes? "Once more it comes down to

money. Training is expensive and eventually the contract staff would have to foot the bill in the form of reduced wages. Now most are in it for the highest fees available and would not be happy about accepting less. Why don't agencies back-up contract slaff when problems

"It's the agency's task to aort

expect to be told about problems before the client, so that trouble

nipped in the bud.

J. K. had the last word "Far from being footloose and fancy-

flye years' solid DP experience be-hind him, and is in the 24-32 age bracket. Their biggest grouse is that they are too often over-qual-

available."

Why are contract staff at often over-qualified for jobs they are warking. "Nobody loves an agent," he says in reply to a question about contract working. "Nobody loves an agent," he says in reply to a question about commission rates.

ified and under-employed for the jobs they are assigned to, but over 70% intend to carry on contract work for at least two years."

Puzzlet

TWO pessants of the Nile villey, both poor men, pool the resources to buy a circular grindatone in the local bazar. They live several miles apart, so by mutual agreement the aderman takes, the store first promising to hend it over to be partnet when half the circle is worn away (ignoring the small hole in the centre). Neither man hes eny jernel education, but they do have the circle in the centre of the small centre of the small centre of the small centre.

education, but they do have us traditional measuring tools of the analent Pheraohs—a stake and langth of rope. How is the halfway stage to be celculated it all boils down to the job of constructing one circle half the grae of another, using compare and etraight adge only. See page 37 for the solution.

DIGITAL . ANDERSON JACOBSON . TRANSDATA . AM JACQUARD . MELLORDATA . NEWBURY LABORATORIES . TEXAS Monitors and Separate P/T Casselle units from 243 per month Separate Diskette units from 260 per month Continet Mike Brooke or Phillip Ely. Tel: Byfleet 53151 & 49618 compalible from 233 per mini APL from \$47 per month: VT52 and other optinhs with the L47 per month SHORT TERM NEWTALS WIDD Daisy Wheel Irom \$104 per month THEND • QUME • DIABLO • LEAR SIEGLER • TALLY • PERICOM • TECHTRAN Specialists in the renting of terminals

SOFTWARE FILE

Protection for micro users

tion of the trade as a whole.

"People like us have to go in and

pick up the pieces once the damage is done. Customers should be able

to buy business systems that run reliably for ever and a day, but if

they are new to the computer gunie

they can only trust what they are told and can easily get cheated without some sort of security."

Rules

specialists in different areas of the UK so that customers can go to a

local dealer for purchase and support. Specialised areas such as

systems for garages, market re-

could then be marketed nationally through agreements with their

The rules for membership are

still being worked out, but Wills intends that the association should

Another alm of SPA is to link

apart as soon as they are looked at.

First-time users in particular get fails to meet SPA's standards. A NATIONAL association is being set up for software houses specialising in tailored programs for the small business cod of the First-time users in particular get ripped off buying systems that fail as soon as they're used — and that doesn't do any good to the reputa-

As well as setting standards for the industry, its concern is to protect the users - predominantly first-time computer users - who invest £12,000 or under in a microcomputer to help run their business, only to run into trouble with software which does not do its

The aim of the Software Producers' Association, called SPA, is to provide a range of high quality software packages which will be guaranteed and supported by members throughout the UK. Part of the plan is that program packages endorsed by SPA will have a mooey-back guarantee and all programs will be tailored to the user's requirements and supported by a maintenance contract.

Ripped off

One of the founder members hopleg to bring about this users' Utopia is Peter Wills of Mercator Management Consultants in Bristol, who explained the reasons behind SPA to Computer Weekly.

of writing and support, and invited writing for the micro market, and to contribute software if their methods come up to scratch. rubbish about, packoges which fall Membership can be terminated Wang-Pactel team

offers total system MANUFACTURER Wang and 20 years. The system has over 150 consultancy Pactel plan to enter eoe of the most rapidly expanding software markets haod-in-hand. Pactel's manufacturing and inven-

lory control system, PACS, has been implemented for Wang machines as PACS/VS. PACS/VS will incorporate the oteractive features of Wang'a VS kit into its design and includes online data entry, inquiry and real time update facilities. PACS/VS is based on an integrated database approach with indexed file organisation and multiple key access, and consists of eight modules,

Pactel claims that the PACS system techniques have been de-veloped and proved over the last

Sharp airlines guide cheaper

THE international time sharing hardware alone.

APL service I. P. Sharp has reagreement with software house been, available on Sharp's world-wide packet awitching service for two years, and lists all allies of the software houses. years, and lista all airlines and wheduled services since 1979 and Appleware all scheduled flights for three months shead.

Billings WP

make use of a service set up by the minicomputer.

National TRS-80 User Group.

Which is rioning a computerised Plan will appeal to the same marbulletin board system; Members ket of first-time users as the are able to account the same marbulletin board system; Members ket of first-time users as the

usets in various industries, span-ning a dozen countries.

The main Planning Database module of PACS costs £3,000, and the price of the other optional modules ranges from £1,000 to £3,000, with a top price of £25,000 for the entire system.

The agreement between Pacte

and Wang is an illustration of Wang's concern to get into the software market by teaming up with established software houses to market independently written products. Although users speak highly of Wang systems software the company has not until recently

sought to sell its own applications.

Wang's presence at the recent
Software Info exhibition in Chicago indicated Its desire to be recognised as a marketer of "complete solutions" rather than

moved the surcharge on the use of agreement with software house the Official Airlines Guide data. Mague marketing its MVP acbase, making the cost of an inquiry counting package which has been available on Sharp's world. Wang is now working on agree-

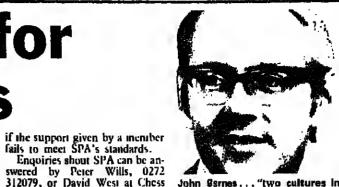
THE miero applications firm ACT

THE word processing package from Mitech for the Billinga microsystem has been enhanced with software for letter and forms processing. At this same time, hardware prices have been reduced to that a single station WP system costs 66,740 and at the top of the range, the triple station system costs (14 925).

TRS-80 service

USERS of Pet and Apple marrocomputers are, invited to marrocomputers are, invited to make use of a service set up by the

are able to access a central message successful Visicale development system outside working hours as tool. It costs £75 from Apple well as the TRS-80 Group's central dealers or from ACT Microsoft in the transfer of Basic programs.



312079, or David West at Chess Consultants on 061-832 6792. 'Four-fold package growth by

tional Data Carp predicts a four-fold growth in the psckage market between 1979 and the mid-

The report, Independent Packaged Sultware Reference Book, identifies the reasons for growth in this market as the lack of quality software from manufacturera and the increasing costs of in-house development. Here it agrees with the large number of aurveya done in the level of information required.

John Ssrnes... "two cultures in

A REPORT from the US Interna-1DC is slsu launching an IBM Marketing Information Service for the growing number of 1BM-watchers in the industry. It aims to

track 10,000 IBM and plug-compauble users in the US, reporting current confirment and migration plans. The service is designed to

fence language Ada.
John Barnes (left), author of the language RTL/2 and consultant to the Dol on Ada policy, gave a his-torical overview of the language's development through its various stages of Struwman, Woodenman, Tinman, Ironman and Stecknau. Of the four colunr-coded hut otherwise annnymous tenders, Cll-IlB's "green" plan was occepted and adopted as the pre-liminary pattern for development,

He explained that the main targets of Ada were reliability and the avnidance ul irrelevant detail. Barnes put furward the idea of two cultures in software: the professional, which emerged in the mid-50s with Fortran, and the recently arrived "amateur", as characterised by the user of Besic and (a shility.

which has now resulted in Ada.

Ada's impact to be 'professional'

by Claire Gooding

THE BCS conference on the lin-pact of Aila last week saw a distin-grammers. guished gathering of programmers, analysts and academics ferences between these two "culoning up on that most significant tures" in terms of language oses,

nilestone in software, the US de investment and maintenance in software. He identified Ada as a "professional" language, since while it took more time and care to write it, it was aimed at long-term comprehension and durability. Easy to read

Illustrating the point with two lines of APL and the same probtem expressed in nine lines of Ada, he demonstrated that while Ada might take longer to write, it was easily read and inderstood.

The benefits of Ada, he concluded, would be seen in beste and more effective compiler checks, encapsulation and separate cumpilation of particular modules, abstracted data which would allow private declarations, strung tasking and exception handling facili-



Please send me the full PT7 story

مكذا منه لاطل

by Eileen Stainer

Well in luly 1

Teleprocessing offers a career path to ops

be sure that inside are grown men operations will concern itself with over their promotion prospects. For operators, or ambinious ones at any rate, the payamation lines of ten have a special note of pathos because there is no obvious career particleyond the post of ops man-

One way that ops can make themselves more important, in their own eves and in everylooly elac's, is to get smart when they hose that a teleprocessing network might be established around their

Status

To an operations department as a whole, teleprocessing is viewed both as a challenge and o threat. Within data preparation and control it represents a reduction in workload and a corresponding drop in staff. Within operations itself, it brings more kit, more status and demands a change of role.

At one level this change of role is on a day-to-day level. For example, during the day sluft



mpular Field Maintenance Ltd.

mointaining an unline system. Whether it is an inquiry, a remote iob cutry or a real-time system, the nser has more direct contact with the central machine and will therefore know what effect the ops department has on that machine.

A teleprocessing system means that operations can no lonner hide behind a user haison area or well-For the enreer minded empire

builders among ops, the change in role has the effect of giving them a footbold on the management hierarchy. Perhaps the real challenge of teleprocessing to operations is must know mare about the hardware and the husiness it

If samething goes wrong it is an longer enough for the ups to peep into a run dependency manual and then shout for engineers and support prugrammers. With teleprocessing there are many horrors which un operations team

must recognise and plan for. The teleprocessing system hreaks down . . . the worehouse is mable in pack orders . . . the production line, starved of parts, falters and scures of workers are left twiddling their thumbs . . . such events are all too likely and pose questions to the ops department which it should have the knowiedge to onswer.

Consultative

How do you create a productivity scheme for factory hands which allows for computer breakdown? This would be particularly difficult if their shop sleward had already seen a reduction in the clerical staff he bad previously been looking after. But it's the kind of management decision which, at the very least, demands that operaons has a conaultative role.

The nature of teleprocessing gives an ops manager a good deal of potential clout.

Many installations do not pro-vide the necessary skills and

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This is the exhibition for the electronics enthusiast. From November 28:30 there is only one place in the universe for the electronics enthusiast to be — Breedboard 80. At the Royal Electronic enthusiast to be — Breedboard 80. At the Royal Electronic enthusiast to be — Breedboard 80. At the Royal Electronic enthusiast for the Breedboard 80. Exhibiting, including all the top monthly realizations in the field: There will be demonstrations on most stands and many feature special offers that are EXCLUSIVE.

lo Breadboardi All aspects of this lascinating held are catered for, from CB to home computing, so whether you want to buy a soldering iron or a synthesiser or just keep up to dale with your hooby to don't miss Broadpoord 80

it is a well-staged plan by develonment to retain or even claw back control. In other instances it is a reluctance of general management to recognise the ops manager as anything more than a jumpedup machine minder.

Such an attitude is common and perfectly illustrated by the sites where the ops manager is not dignilled with the ritle of "manager but has to be content with "supervisor" or "controller." It's the class system rearing its wrinkled old head,

Challenges

More easily remedied is the relitetauce of ops inanagement itself tn accept responsibility for teleprocessing users. Are they in see themselves nierely as managers of their own little cambage patches and feel all nervous and humble when they poke their heads out uf the cumputer room? Or as managers in the context of the com-

pany where they work?
This is a subject neor to the heart of Phil Cartnell, from Infoteels Operations, the Majdenheadbased training organisation. He believes that teleprocessing

belings to the operations deportment and sees it as giving ops man-agers technical and psychological challenges which many of them are not prepared to meet.
"I can couot the real managers

in ops that I know on one hand,' he says. In his book the real man-

computer room, "These guys don't seem to realise that there is anything higger for them." He continues: "In many instal-

lations I see compromises. There are half-hearted attempts at structure and jub responsibilities with perhaps an addition to the operating team's duties in provide first level releprocessing support. Any technical problems, however are immediately remained either to a technical support area or the ilesign affice. It is not recugnised by many operating personnel that a so-called technical problem is the withdrawal of a service and is a direct challenge to the husiness phjectives of the system under threat. This is the same whether it's one

terminal or a complete network at Cartmell argues that for the con-tinued survival of the operating team at a higher level than bittonpushers, they need to ensure that they cuntrol the network and have the necessary business reloted knowledge, technical knowledge

and outhurity to cope.

As a first step lie believes that
ops should involve themselves in teleprocessing from the design stage through to implementation. He lists eight activities in which they should have soone say; network planning; terminal and line configuration and selection; system aims; user education and expectations; user terminol training; processing throughput; acrylce levels and monitoring



CARTMELL: "Operators don't seem to realise there is anything

Carimell is swift to ask whether it is fair to expect that nps should show such initiative and accept responsibilities as well as operating a mainframe. His answer, naturally enough, is that nps must be trained to the job — and such a training is provided by Inforceh.

Qualities

Infotech is onxious to promote the position of network controlle who is not envisaged as a keen like with a screw-driver but as someone able to decide priorities and who can deal with both people and

monkey work they are going to be loss. It was eventually traced to a treated like monkeys and can't ex-pect much better. If they become the kind of ell-rounders that Cart-trickle of income. This was maced mell suggests they should be, there to an nld lady. There was na test would be no ground for the recurrent gripe that they are everybody's pobody.

There was no let the system to account for the fact that she had carried on paying her husband's life is-

dy'a nobody.

Teleproceasing is certainly something where ops can get involved os managers as well as workers, and promises a jump in workers, and promises a jump in the certain of this is that while the company of the control of the company of t status for those who take the than others, the computer excuse chance.

Keeping customer satisfied

THE purpose of an excuse is to give a reason why something has gone wrong. For many clerks past to catch flak on behalf of a large corporation it often doesn't miller if the reason is true or false. What is important is whether the reason s plausible enough to send a

Screaming punter on his way.
One of the surest and most in crutable excuses known to modern The ACM (the American equinlent of the BCS) formed a subcommittee to investigate what by behind a batch of such excuses. It should have come as no surprise that in one case it was discovered

Phantoms

However, sometimes the comeducational market from hardware features to software applications packages, better distribution count for 85% of the totol methods, lessing, service and war-shipments to US educations. to do - is involved. Recently an insurance business appeared to be If ops are restricted to doing generating millions of pounds of The report predicts that soft-ware tales should rise by an average of 28% over the next five years that are participating in the education market include Atari, Texas and that this growth will be fast for Instruments, Cromemco, Hewlett the first three years and slower in Packard, Intertee, North Star, Texas bid to boost

'Persuade them you are a manager'

Farello, an American employed as a management ennsultant with Ford, Bacon and Davia, gave e three-day seminar, organised by Frost and Sullivan, on the effective use of computer operations man-agement. And he chewed over much the same problem as bothers Phil Cartmell, asking "How are we

For a start "objectives" had to authority for the ops manager to be defined and everything had to participate to any significant debe "effective" in dollar terms, but gree, it is difficult to pln down these are general conditions of life

the first morning and left before the talk became too lechnical. teacher and had the 25 particlpants, all of whom were concerned with ops management, grouped in a crescent rather than hiding behind each other to rows...

"You'll never win anything by emotion," said Farello, "you'll win it by facts: give the management meaningful numbers that they understand."

Central to Farello's argument was that management looks at operations people as technicians

"I strongly suggest that you as

The man who wanted

CONTRACT operator, who permenent pnat, wes in-terviewed end socepted for e job in Scandinsyla. The depar-ture data was set and travel erangements discussed. "Heathrow or Gatwick?" In

quired the op.

"Imminghem, And we'll pay
your train fere up there," replied the agency.
The op declined to go unless

The agency told him that they couldn't afford an air ticket and threats of litigation followed the operator's refussi to change his mind.

Sume while afterwards the open working for and naturally shough, he wes asked why he had not made the trip.

trip. He told of his penchant for all travel.

"That is very strangs," said his would have bean boas. "Much of our work is the an alithe, so we were able to send the agency a free ticket for you.

Very strange.

plan os a way of persuading management thal you are o manager. he continued. To that end ops managers should know the organisation's annual plan, the user's plan and have a knowledge of the He said that when he realised this and presented his manage-

. When he saked how many of the delegates knew what applications were being planned only three out of the 25 put their hands up, so Farello had a point. His message is clear: "Get out of meot with his own plan, full of facts and figures, the management had met his budget suggestions.

your narrow operational world and find out what's going on."

even investigated oogoing appl

tion changes and the corporate so-

CONFERENCES

New directions for NATO

A CONFERENCE covering new directions and forecasts for NATO will take place at the Royal Actonautical Society. Lecture Theatre, Hamilton Place, London on December I and 2. Sponsored by the Technical Marketing Society of America and the Technology Transfer Society, the conference featores experts from the US Army, Air Porce, Marines, Defence Advanced Research Projects Agency and US/Buropean industry, who will look of the entire weapons spectrum and combat vehicles.

It is called Banlefield Weapons Systems and Technology and the fee is £235, Further information from State of the Art, telephone 01-242 4045.

COMPUTERVISION 81 will feature computer, on film making and computers in film making and computers in film making and computers in film making and computer adds in publishing and manufacturing. The event will take place of the Cafe Royal Conference Centre, Regent Strept, Londoo from January, 12-14. Organised by NorMedia, the conference will enable media executives, industrial managers and their consultants to examine the current techniques being used in entertainment, publishing, macufacilluring, design, education, telesco, and government. Conference chairman is Joho Halas, president of the interhational Animated Film Association. Tackets are \$207, including VAT. Further information from Normedia, 37 New Band Street; London WIY 9HB, Tel: 01-629 9381.

SOUTHCON 81 makes its debut is Atlanta's Georgia World Coapters Centre from January 13-15. It is simed at design and specifying engineers in electronics, as well as those incoporating electronics: Into their traditional disciplines, for example the furnitional extiles and appliance industries. The conference is two events in one; as exhibition for manufacturers, supplier, managers and marketing executives in the electronics of electronics-related in dustries; and a professional programms featuring presentations by scientist and engineers lovolved in electronic and new ideas in high technology. The event is sponsored by the IEEE region three; Atlanta section, IEEE; Florida Council, IEEE, and the Digit, Supshine and Fledmont chaptra, P.A. (Electronic Representative Association). In communed by yolusten Supshine and Piedment chapitry. Associ(Blectronic Representative Assocition). It is organised by volunted
from the industry, most of whom semembers of the sponsoring associtions. For further information, its
phone Robert Myers on California 13.
475 4571. 475 4571.

A75 4571.

ROGER VALLO, president of GTE Communications Network and Frank Yung; chairman of the telecommunications outnoity of Single pore, will address the opening plenary session of the third Pacific Telecommunications. Conference to be held from January 12-14 at the likal Hetel, in Honolulu, Hawaii. The conference organised by the Pacific Telecommunications in China sat successions controlled the telecommunications in China sat successions the properties of the teleconference discussing government and business experiences in such teleconference discussing sovernment and business experiences in such teleconference discussing sovernment and business experiences in such teleconference discussing sovernment and business experiences in such teleconference of successions. For surface in such teleconference of the succession of the

According to TI, sales in the UK have "not been high", but the company puts this down to the fact that the PAL system is not yet available. For users to operate tho

Speech chip

desired consumer interest,

Initiated three months ago, the

the company's next step. Meanw-

hile, at least two dealers have al-

ready discontinued the product, and others are coosidering doing

the same, because, they say, it is overpriced and lacks software.

eted, and dealers are owalting

MICRO NEWS

lion a year by 1985, and account for 20% of the total microcom-

espected to be greater than 30%

for unit shipments.
The report, Microcooputers in

Education, analyses the market for

US systems costing under \$15,000

which meet certain design require-

ments. It states that 13 companies

produce over 98% of the market,

and seven others have possible po-

tential for competing. At least 50 companies meet these require-

According to Creative Strategies the emphasis has shifted in the

'talking' sales

Education 20% of

Peripherals are expected to grow

compound average annual growth rate of 26%. In the US, however, the report

predicts that the present potential morket will be saturated by 1987,

given the current growth rate. It is

likely that the number of potential

users will increase over the next

five years due to the increasing

penetration of educational institu-

tions and the expanding use for

shares in education are similar to

those in the overall market: Tandy

mmodore takes a large portion

leads in terms of unit ahipments;

Apple leads on sales figures; while

of the balance. These three ac

shipments to US educational

Others mentioned in the repor

Of these 13 companies, market

microcomputers in education.

from GIM SPEECH synthesis ohl which can run two methods of voice production including linear predictive coding the one used by Tayer Ins one used by Texas Instrument of General Instrument Microelectronics at Electronics 80 in Munich 1854 week.

The SPO 256 operates mainly in the phoneme mode, but against the IPC

mainly in the phoneme mode, but can use the LPC method for good quality speech in phoneme coding, words are sliced into the 64 building block sounds, or phonemes of the English anguage, and put into hemory. On receil of a word, the phonemes are selected with the help of computer aids and constituted into the given word.

Word.
Aveilable for \$10, the SPO 256 has 16K-bits of ROM built in to the 28-pin NMOS device, which can reproduce up to 258 discrete sequences (wards or phrases).

SALES of Texas Instruments' 99/4 talking home computer in the US have been disturbing enough to warrant the company running a rebate programme. Bul, according to TI retailers in the US, the programme, which was meant to help boost sales, has not generated the desired consumer interest.

99/4 in the UK so the moment, special monitors must be incorporated into the system, which respond to both the US colour standard, NISC and PAL. This puts the price up to about £1,000.

Too high'

US dealers are complaining that the price in the US is too high; it is listing at \$950 for the console and \$450 for the monitor. The rebate programme offered a \$100 reduction on the price of the hardware, with \$100 worth of software free. But the only software available at the moment is educationally

The 99/4 system with PAL will become available in the UK next year. No programmes for boosting sales in the UK have yet been planned by TI.

Filling a gap BLETCHLEY-BASED Remek

Micro Electronics has introduced a stand-alone expandable single board computer for use as an industrial control system. For under £500, the 16MC20, which is based on Texas Instruments 16-bit 9981 microprocessor, fills a gap between programmable logic controllers

500 accessories

ABOUT 500 different accessorie for minicomputers and micros are now available from the UK centre now available from the UK centre set ilp at Runcorn. Cheshire, by the US firm Inmae which claims lo be the largest independent distributor of its kind in the world. A catalogue can be obtained by phoning Runcorn (092 85) 67551.

Prices down

PRICES of Intel's 8748 single chip 8-bit microcomputer have been re-duced by up to 30%. In 100-piece quantities the high temperature 6MHz device, the D8748, costa \$53 and the lower temperature D8748-6 costa \$41,50. The 2.6MHz device now costs \$31.50. 3.6MHz device now costs \$31.50.

SALES of microcomputers in the the last two. The introduction of US education market will approach o retail value of \$350 milies. Those not yet involved in this market include Computhink, an associate of ACT, Onyx, Pertec, Sord and Zilog. puter market, according to 8 report compiled by Creative Strateget in the US. The overall
compound annual growth rate is

The report defines the various ways in which microcomputers can be used in education - firstly, the businesa aspect. Microcomputers for administrative purposes repre-sent 5% of total microcomputer use in education In educational research.

microcomputera represent 1% (graphics and specialised sultwore. In the classroom, microcomput ers can be used in three ways: com-

puter assisted instruction, compa ter programming instruction and instruction in computer funda-mentals. Classroom work repre-sents 90 to 95% of all educational



A BUREAU service in rose with the ACT Serise 800 microcomputer ipictured shovel is to be isunched at the Which Computer Show to be hald at the NEC in Birmingham next week. ACT is also isunching a new range of business systems besed on the 800 system and oslied the 850.

The besic mudel in the range, the 852, comprise an

800 which runs the 6502 microprocessor from MOS Technology; a VDU, keyboard and two live-inch lioppy disc drives with a storage cepseity ni 800K-bytes. It is menufactured by Computhink in the US.

At the top of the renge the 854 and the 855 are based on 8-inch disc drives giving 2.4M-bytes of etc.

"I need money to make my ideas work -but who'll listen to just ideas?"

Like most people running a business, you'll reach a time when you want to expand. You'll need to borrow money. But how do you get your

proposal down on paper to convince a bank manager?

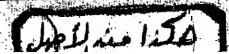
Lloyds Bank knows it can be difficult. So we'll help you get the case together. One of our Finance Series handbooks "Making a small business bigger" has a section giving step-by-step guidance on how to present your case. convincingly.

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Come in and pick up the booklets - or talk to us about your ideas. We'll try to help.

More help for business | LLOYDS At the sign of the Black Horse





One contract turns

the tide for Cray

JUST one cuntract, the sale of a new loss of \$288,000 in the third

Logica in talks to sell teletext system in US

formation supply industry look set to be made by Logica, which is negotiating with a US company to sell a relevent system for use in North America. The US firm involved is not yet known, but it is

probably one of the broadcasting organisations.
The lack of central direction in US releconmomeations has left the US behind several European countries in implementation of such services as teletext, which broadcasts textual information "in the back of" televisinn programmes. Logica's system will be an connectition with several ather incompatible services. If one of these wins out and eventually becomes the standard, the market could

be rety large.
Logica's chairman, Philip Highes, announced this development while reporting the company's anomal linaucial results, which show incrower up 40% over 1979 to £18.7 million. Staff has increased

hy 20% to 900, including about 75 new graduates. The pre-tax profit of £677,992 was described by Hughes as "disappointing by past standards," owing to losses on several fixed-price contracts in the Netherlands. New offices have been opened in a Victorian mansion in Cobham Park, Surrey, renovated at a cost of £500,000. This

was an attraction for potential senjor staff who alid not want to work in Central London. A technology management centre has been set up within the

company, taking over from the management sciences operation which had been getting considerably less business of late. Brisn Martin, heading the new centre, sees it as helping client companies to adapt to the changes companies to adapt to the changes hrought about by computer systems installed either by Logica or other suppliers. This involves training stell and management and such things as restructuring staff gradings.

Paintbox

Logica is getting more involved in bringing one-off developments to a wider market place. Hughes said. An example is the Paintbox system, developed by the BBC, which allows ertists to produce very high resolution graphics for broadcasting using a drawing tablet and a micro.

tablet and a micro.

Artists cao draw quite detailed diagmms and pictures, using a variety of different brush shapes, sizes and colours. A simulated "air gun" allows the filling-in of ereas with colour, and very simple animation with flashing is being developed. The finished picture is stored in digital form on a floppy disc.

The development of Paintbox was entirely internal to the BBC, but Logica has a licence to manu-



Logics has opened new offices in a Victorian mension in Cobham Park, Surrey, renovated at a cost of £500,000.

Viewdata system for online travel bookings

of place by Thomson Holidays to lines and boost local processing with screen formats that conform develop a private viewdata system on Redifon kit for online bookings (CW, November 6) systems house System Aid has said that it will use empanies, It licenses its software the Prestel compatible viewdata facilities on the ICL ME29 to develop a similar application.

It will enable travel agents to make reservations using Prestel

System Ald also plans to use the

X25 support provided by the MB29 to develop software for linking into the British Telecom Public Packet Switched Network. will enable travel companies to

Nearly silent

CENTRONICS has a 300 lpm printer which, it says, is almost silent and therefore highly suit-able for the typical office anvi-ronment as well as the compu-

ter room.
Based on Centronics' 600 series of printers, the 6080 has a noise level below 60 decibels and may be field upgraded from 300 to 600 lpm.

moves to

COMPUTER WEEKLY moves on

Quadrant House, The Quadrant Sutton, Surrey SM2 5AS Tel: 01-661-3500 Telex: BisprsG 872084

F3.115.0

10 November 1980 to

'Involve operators in **VDU** design' plea

Compagnia Italiano di Turismo.

The planned private viewdata by about 20 afrlines.

£600,000. In addition System tour operators' reservation

with the standard drawn up by the

Holiday Systems Group.
This is the committee set up by

the major tour companies to en-

sure that egeots are not confused

by many different types of viewdata picture.
Connection to PSS will enable

ayatems to be added to Travicom

2. This is the PSS-based network

planned to replace the existing Travicom system which uses dedi-

cated lines to link travel agents to

calling in the occupational psycho-logial after the design of the VDU has already been fixed. It's too late

Co-author of Vision and VDUs.

the user as well as the marvellous

equipment. We need less reflective

screens and fewer characters on the screens," he added. The first of three seminars on

VDUs and their effects is to be

held by the Human Science and Further Advanced Technology

Research Group, HUSAT, on De-

cember 11. Information from th

VDU manufacturers were slated in London last week for the scant stiention they pay to ergonomic considerations in the design of their products.

System Aid derives most of its business from acryices for travel

to firms with their own in-house

ICL machines like Yugotours and Cosmos, the letter having just ordered three MB29s worth

Ald'a own machines, which con-

sist of a six-year-old 2904 as well

as a new ME29, are used by travel

firms with no in-house computer, like Global and the UK end of

Sam Rosenthall, pointed to three main problems relating to VDUs; the visual unsuitability of the user, the quality of the equipment and the layout of the office, but stressed that none was insoluble.

"We must consider the needs of the user as well as the negrobles." Speakers at Datasonb's ergo-nomics conference urged montifacthrees to involve operators, psychologists and ergonomists in design, rather than relying solely on engineers who concentrate on providing efficient and reliable systems.

Too late

An occupational psychologist with British Telecom, Hernard Stewart, said that some systems had screens which often provided

IBM-based retail system

First commercial **Cambridge Ring** up in 12 hours

THE first commercial implementation of the Cambdinge Ring systam, delivered to imperied Chamical Industries, was installed and running within 12 hours. And this included the time Orbis managing director Hermann Hausar is siao managing director of Acom Computer, makar of the Atom microcommaker of the Atom microcomputer which etarts at £120 is it form, so Orbis is developing a Cembridge Ring interface for the Atom with a target price at £200 for the interface board.

Hauser's partner in Orbis is Andy Hopper, who as a justice interface in the Rings University is involved in research on the Ring. taken to find and fix e fault in one taken to find and fix e fault in one of the processors to be attoched.

The system, delivered to ICI's plant in Runcorn, Cheshire, is also a "first" for the Cembridge-based company Orbia Computer.

Their first product, it uses medium and amplicate in the

Their first product, it uses medium and smell-scale integrated circuits as specified by Cambridge University Computer Laboratory, where the Ring was developed, and a board layout produced by University College London.

Orbis production engineered the product and built the power aupply, packeging and interfeces for the first two eystems to be connected to the Ring at Runcorn—a Computer Automation LSi-4 and a Digital Equipment PDP-11. The software to drive the interfaces was commissioned from Topexpress, another small com-Is involved in research on the Ring. The company alms to handle a range of natwerks, both made in-house end bought is. Ethernet is e possible foturapar of the range, as is Ecolet, the system being developed for the Acorn Atom which is to have a trial system installed at Long Road Comprehensive School is Cembridge next month.

Collision

Econet uses a four-wire cable with centrally generated ded signels on two of them runshi in enti-phase to each other and data on the other two, sice in enti-phase, being transmitted at 200K-bps for up to 500 metral. Collision detect is by saneing intermediate voltage isvila brought about when somes! the colliding bits cancel each other

tarfaces was commissioned from Topexpress, another small sompsny nacrby, which like Orbia sprang up out of the ecademic community in Cambridge. Imperial's Ring is a trial system with just four nodes coeting £1,200 each and a monitor station costing £1,500, plus the interfaces at £500 each.

Costa are expacted to fall to about £500 per node — consist-Econat Interfaces are expected Econat Interfaces are expeted to cost batween £50 and £50, giving a station price of about £30 complete with Atom and islession. This would have two tho bytes of RAM and 8K Besic in ROM and would be useful for teaching Besis in a classroom. This appliestion is aided by the "acreen" routing which enables the properties of the station to some the contraction of the station to some the contraction of the station to some the contraction of the station to some the st supervisory station to copy the acrean image of any of the ste-dents' stations on to its own

APL ★ PLUS 1980 EDUCATION PROGRAMME

Costa are expected to fall to about £500 par noda — consisting of a station and a repester in asch — when Ferranti gats the LSt implementation into production next year. First eamples have been tested in Cambridge and are working over 80% of their area. Second stage eamples are expected early next year.

are expected serly next year.
Customers for the finished
Item are expected to include Recel and Logica.

Learn APL in 3 days

APL * PLUS hae limited piecee on ite next 3-day APL course to be held in London on 8th -10th December,

The course is practicel: by the third day ettendees will be producing programs relevant to their working environment. Students do not need a computing background:

the course is designed for managers, engineers, scientists, finencial enalysis, eccountents end other disciplines, es well es for DP steff. Any numerale person will find it enjoyable and stimulating.

During the course extensive use is made of the APL★PLUS Ilme-ehering service for exemples and case-studies; experimentation in the language is encouraged and the course covers: Components of the APL lenguage
 Dele handling in

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leechers from our London office and is held in our Chancery Lane Education Centre. The course fee of £300.00 (+ VAT) includes ell course meteriels, computer lime and lunches. As spece is limited, return the co below es soon as possible to ensure your piece, or call Veronica Miller on 01-242 8135.

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COMPANY NEWS

NCR succeeds with \$60m offer for ADDS

ing date of its offer several times, and being threatened with liugation, NCR has finally aucceeded in As expected ADDS will continue to operate with its own man-main products sold by ADDS UK agement, enjoying a high degree of autonomy despite being wholly owned by NCR. The subsidiary set up by NCR to buy ADDS shares has now been merged into is bid to take over terminal manufacturer Applied Digital Data
Systems of Hauppage, New York.
By the time its offer finally expired oo November 6 NCR had ADDS. picked up 92% of both the common and preferred ahares of - A spokesman for ADDS UK, ADDS at \$12 and \$27, respecti- wholly owned subsidiary of the US

City firm takes over **Bunzl bureau—for free**

for about four years.

Index: 101.91 Change: -2.42

ROLPH AND NOLAN, the City firm taking over the bureau side of Hunzi Data Systems (CW). November 12) is paying BDS parent Bunzi Pulp and Paper nothing for the alling bureau'a customer line-up.

City firm taking over the bureau the City. It is also paying Bunzi the City. It is also paying Bunzi \$16,3000 for some fixed assets. Rolfe and Nolan is also taking on eight of the ten staff that ran the BDS bureau. It generates an the BDS bureau, it generates an the BDS bureau it generates an the BDS bureau. tomer line-up. the BDS bureau. It generates an But under the terms of the estimated £180,000 worth of bush

egreement between the rwo companies Rolfe and Nolan will rent the Digital Equipment PDP-11/70 that hosts the BDS services and take out a five-year lesse on the large the terms of the services, aimed mainly at commodity brokers, are run on two PDP-11/70s originally supplied by BDS. There have been close trading

CIG group buys Metra stake in Lowndes-Ajax

THE Brussels-based CIG Group which bought the Lownder Alax bursey from Hill Semue this year, has now reached at spreament with the Metra Con sulting Group of France to bu out its minority share in Metra Lowness-Ajax. The deal should be completed by Christmas. Based at Groydon, Matra Lowness-Ajax, provides facili-ties management, turnkay

systems, software and sonsulting services.
Last year it took over Tampo Timesharing, the Digital Equip-ment specialist systems house, and renemed it MLA Business Systems.

SHARES TABLE

single surcen version. The OEM terminal products of ADDS, which are still the biggest side of its business, are sold here by Terminal Displey Systems of Blackburn.

NCR has been by far the biggest ADDS OEM customer and its move to in-house VDU manufac-

sured by NCR here that they

would remain autunomous. The

turing could heve hit ADDS hard financially without the takeover. ADDS turnover for its current financial year ended November 30 is unlikely to be more than \$10 million up on last year's figure of about \$51 million. At the same \$12,122,000.

its energies of lote have been chanuelled into expanding manufactur-

Some ADDS shareholders tried to stop the NCR takeover with to stop the NCR takeover with legal action, although the level of opposition to the NCR bid was limited compared with the objections raised to a bid made in the summer by the Mitel Corp of Canada (CW, July 31). Mitel offered \$11 and \$25 for the cummon and preferred blance. mou and preferred shares.

Storage ahead

STORAGE Technology results for the third quarter, ended September 26, show that it is sustaining profitable growth. Turnover increased by about 24% to more than \$150 million while net profits moved up from \$11,332,000 to

Cray-I supercomputer in the Mit-subishi Institute in Tokyo, has net profit of \$1,646,000. privided Cray Research with re-sults for the third quarter, ended

September 30, of its current finaneial year that show a drainatic improvement over the same period in 1979. Turnover jumped from

\$4,392,000 to \$12,634,000 while a with \$28,424,000 last year.

Harris doubles its shares

PAVING the way for possible future acquisitions ur financing programmes, Harris Carp in the US has doubled its number of sutherised shares from 50 million to 100 million. There are currently some 30,446,000 Harris shares outstanding, the rest being un-

Harris chairmen Dr Joseph Boyd said there were no current plans for the additional shares but pointed out that they would give the company "flexibility to take prompt advantage of the opportu-

nities that may occur."
The Florids-based compan recorded net profits of \$20.7 mil lion on a turnover of \$348 million in the first quarter, ended September 26, of this financial year.

The narore of Cray's business has inevitably resulted in hig

changes from quarter to quarter

But the results for the first nine

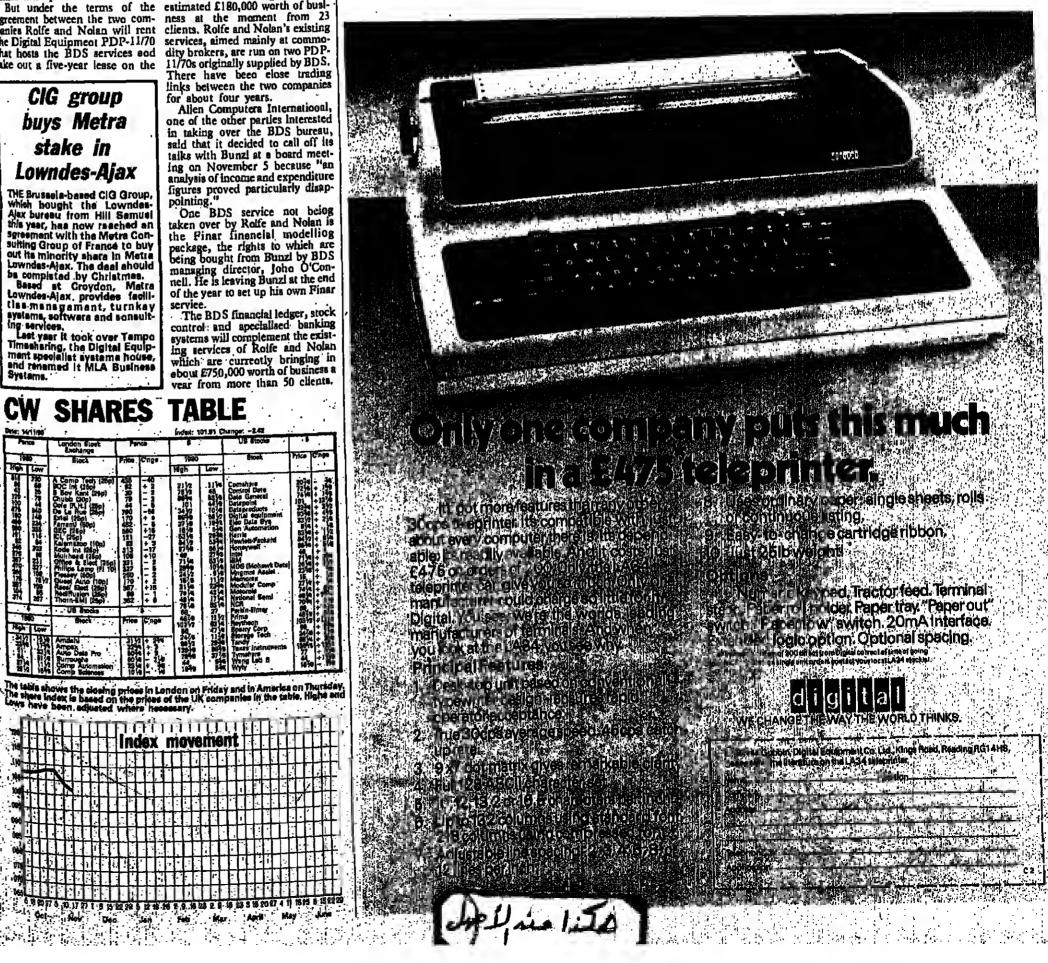
months of 1980 indicate a long-

term upwards trend. Turnover

came to \$44,080,000, compared

Sales up 300%

INGERSOLL Electronics reports thar compeny sales for this year ere up more than 300% on last year. The increose is attributed mainly to the soccuss of the Atari hom video computer system which is distributed in the UK by Ingersoll.



IAL Gemini launches

AN IBM-based retail system has been launched in the UK by IAL compiler Systems.

Called Storemaster I, and based on software from Fisher Business Systems of Atlanta, Georgia, the system is sinted at the amulicute system is sinted at the amulicute lailor with an annual turnover of up to L3 million.

It runs on an IBM 5120 small husiness computer with point-of sale facilities provided by the IBM 5160 computerised cash register a device which supports OCR and bar code readers. The basic soft ware costs about 15,000 and hardware starts at £8,300.

Capable, of handling 31,000 for non-computer specialists.

PEOPLE and EVENTS

Project leader wins IEETE women's award

electronic engineering and is in the third year of her BSe in electronics. Runner-up was 25-year-old Sally

Maurice Scott has been appointed tinancial director of Signa Electronics. the was formerly financial cantroller at Racat-Zonal and KDG Instruments.

Roger Mooroy has joined ATS Telemetry in Haywards Heath as chief engineer. His previous caperience has included positions with Monolog Systems and Computing Techniques.

David Low is the new managing director of AC1' Microsoft, He was formerly European manages of the company's microcomputer division.

Kevis Paucia has been appointed manager of the new Technical Support Division of Computermail. Colin Winso has been named UK sales manager at the company's Sales and Marketing Division.

William Tolleager has been appointed director of systems ragineering at Ifastech in New Itampshire, US. He previously worked for Hendrix lilectronics, where be supervised the engineering and development of the

PROJECT leader Fenetla Hume has bren named Garl Technician lingueer at Claxo Production and linguinger at the Year. She receives an inscribed Services, She is currently working un of the Year. Services. She is currently working un o rose howf and £250.

Ilganilan-born Hume, who is 23, began her catter as a trained test engineer in 1974 with Cambridge Scientific the Grinnenn. During her four years with the company site was promoted to service workshop engineer and then junior design engineer. In 1978 she junior design engineer. In 1978 she junior design engineer and then junior design engineer. In 1978 she junior design engineer and then junior design engineer. In 1978 she junior and facette Recommunications; Jayne Wood of Alerconi Advisors and Engette Recommunications; Jayne Wood of Alerconi Advisors and Engette Recommunications. Arringent. During her four years with the company site was promoted to service workshop engineer and then junior design engineer. In 1978 she junior design engineer. In 1978 she junior design engineer. In 1978 she junior design engineer, and in September last year was principled to pro-

enther last year was principled to pro-cal leader.

The award is sponsored by the She has an HNC in electrical and lectronic engineering and is in the Memorial Trust. The number of entrants this year was between 20 and 30, according to John Channell of RETE.

Dunena Johoaton, farmer real estate manager of Burrougha Machines, has taken on a almilar post with the company's Europe/Africa Division. Before joining Burroughs, be worked in local and national government and with several large companies including the Grand Metropolitan Hotels group. His successor is Chris Glibert, formely Burrougha' assistant real estate

Trevor Cotton has loined ICL'a Southern Sector Marketing Department as software and services manager. He was previously with Dataskil, working as product planning and accurations consultant

merly Burroughs' assistant real estate

Peter Heptoestall has joined Hallmark Computers as business systems sales manager. He joins from Telecom-

Geoff Lawia, who established the Edinburgh division of Mills Associates, has been appointed software administration manager of Mills Associates in Monmouth. Replacing Lewis at Edinburgh is Jack White, who has been promoted from operations manager.

THE ONLY DATATERMINAL

HIDWINGHURACKOVASHDISCOCO

THAT RUNSWITH

SURIUSTAST

ADD THE AGILE LC36 AND

YOU CAN RUN IT WITH

BURROUGHS & IBM SN A/SDLC



Tandem Computers has formed a regional organisation hasded by lormar UK country menagar Jack Chepman. This past of managing director in the UK has been filled by John Louth (above). Louth has spant the lest two years with the company in Chicago and at the Cupartino, California hasdquarters. He previously worked for Burroughe Corp in various head office mensgement positions. Head effice of Tendam's new region is at Psai House, Middlessx, but Indspendent offices will be ecquised during the next lew menths.

RCA expands FIVE systems engineers have been ap-pointed at RCA Systems Services at Guidhorough

Guisborough.

Ian Richeo worked for five years with the Royal Navy, based at HMS Collingwood, where he first taught mathematics and computing and later became involved in a computer purchase to deal with administration and involved to be a section. to deal with administration and training prediction. Colin Bage joins from Wayfringe. Barry Grieves previously worked for Ferranti Computing Systems in South Wales, dealgning computer memories for military systems. Andy Coldridge joins from Marconi where he was a digital design engineer and later microprocessor designer. Paul Massey previously worked for Radius.

This new AGN, 5 4200 Series Date, Terminate are the ONLY 55(5): daisy whise privars that users of Hewlett-Packard's 3000 Series |, II, III of 33 can run at 1200 baud and on full speed with X-on and X-of technic line protocol controlling transmission from the tweet device to prevent the terminal bullet overflowing.

And there's more, Add the AGN, E.C.Se, or single politing programmable communications interface, and you have the only interface that allows any and every Burroughs user.

B-1800 to B-7700, to use the letter-quality AGN, E printer.

Then, If that is not enough for you the LOSS protocols give you compatibility with IBM SNASDLC.

Other AGN, E.200 Series leatures include:

Other AGILE 4200 Series leatures include

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Over 120 stantistri immerie options

Superplot graphics - 5 - 50 times tester than other terminals

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AND MANY MANY MORE

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data sales td

Micros for management

A WORKSHOP on the use of A WORKSHOP on the use of microcomputers for management information is being held at The Churchill, Portman Square, London W1H QAI from November 26-28. Organized by RB Conferences, the workshop has been designed in give participants practical experience with different mini-microcomputers, programmed to handle management information based on probabilities. Those expected to find the course useful are chief executives, and directors/managers concerned with marketing, production, purchasing, R and D and personnel. Tho fee is £385 + VAT, and includes two nights' accommodation. For further information telephone the organisers in 01-946 6062.

Coping with new technology

SEMINAR for senior executives alming to demonstrate how to manage the change brought about by new technologies will be held in Spain from December, 4-7. It is organized by December, 4-7. It is organized by CMS, and will examine the role of the senior executive as well as highlighting management iechniques to show how to overcome currest problems and plan future strategy. Further details of the seminar, to be held at the Hostal da is Gayina, S'Agaro, Costa Brava, from: CMS, Ludgate House, 110 Fleet Street, London ECAA. Tel: 01-583

Chairman of GR International

JACK McNally MBE hea been appointed chairman of GR Internetional Elactronica, Pertit. His career includes 22 years with Beckman Instrumente, 13 of which were taken up as managing diractor, and the last four es chairman of the three Beckmen compenies. He la elao chelrman of Backmen'a operations in

He is currently chairman of Tried Technical and Industrial Services, and deputy chairman of the Scientific Docu-

McNally la e member of the CBI (London) Regional Development and European Committees, and was re-cently elected a Fellow of the Royal Society of Arts.

AS PART of Prime Computer's UK expansion, Nell McMulleo has been appointed managing director. Ite joined Prime with over 18 years' exper-His most recent appointments have been with Computer Automation, where for over two years he was responsible for seles and support operations throughout Europe, and with Sperry Univae (Australia) where he was tesponsible for seles and support aperations throughout New South Wales. Between 1965 and 1974 he held various posts with Honeywell Informetion Systems, starting as a systems representative in Chicago and eventually becoming manager of large systems marketing in the UK. He left Honeywell to work as regional manages

France and Italy.

lan Barnatt has joined Liniathen Computer Services as systems accoun-tant. His previous experience includes managing a yacht chartering concern based in Athena, and three years as financial controller of Melbourne Iron Castings, Walverhampton. Kee Tankard has joined Data Log-ic's Communications Products Divi-ation as sales executive. He previously worked for Nolton Communications,

lae Locke has been appointed principal liaison engineer with Perrantl Computer Systems in Sydney, Australia. He previously held several posts within the Australian Department of Defence at Canberra.

Brias Walker has joloed United Lessing Ltd as UK sales manages. He was formerly with the Inland Revenue.

Kelth Newman has joined the tech-nical support department of Computer Machinery Company's North West Home Counties braneb. He was previously with Leibherr Great

Stove Mawar has joined ABS Computing's research and development department. He joins from BCL, where he was involved in software development and support. Also joining the department are Kalth Rogers, formerly with Racal-Hyperoa, and Ivan Bertram, who previously spent three years at CAP-CCP. Harold Scott has been named national marketlag representative for TRS-80 Videotex sales at Radio Shack,

Art Lambert has been appointed, vice-president and general manager of Computer Cable products division of Vertex Electronics in Farmingdale, New York, He has 18 years' experience in this field. COURSES Office of the Tony Rand has been appointed general massager and financial controller of Sinciair Research of Cambridge. He was previously assistant to the managing director of Trideni Management. Sinciair's new production controller is Dave Chattee, formerly with the company's Radionics division at St Ives. Year entries

Stava Coussins is to be associate director at CMG Computer Management Group. He joined the company is 1976, as a systems and programming

Geoffrey Henley has been appointed senior recruitment consultant at Barnes, Johnson and Partners. He was formerly with Joho Goldsmith Recruit-

ANYONE laterested in entering Office of the Year 1981 Award should contact the Institute of Administrative Management, 205 High Street, Bedenham, Kent. Tel: 01-658 0171.

consultant

PERCY BARRACLOUGH but beet

appointed seniar consultant at System Consultants Ltd (SCL). The company

has made two other new appointment Bob Hair Jaine as system and program

ming development manager, and David Robertage becomes resir

ayatems analyst. All have hed over it years' experience in the computer is





BEING MADE. REDUNDANT! Va)

.. UNTIL OUR PAYE

SYSTEM IS UP



DIARY

Meeting IBM Minico Group BCS head-

50-51 Russell Square, London WCL 7.30.

Fairfield Halls, Croppens

DECEMBER 10

Meeting Role of mathematical programming, BCS, London School of Recommiss, London, 5.30.

Meeting Computers in Museum Meeting Computers in Museum Meeting Computers in Museum Croup, Tickers from Huntingdon Research Control Huatingdon, Cambridges Research Control Huating Research Control Huating Research Control Huating Research Control Huating Research Control Huat

2966 for PAYE

processing Computer Weekly earlier this year (CW April 17), the "time slicing" technique is being used to allow 2900s to run VME and DME ICL deputy managing director Peter Ellis has confirmed that the com-pany will be offering its new 2966 mainframe in the Inland Revenue as the machine for handling online PAYE processing. After talking to ICL for more than two years the Inland Revenue has simultaneously. A microprogrammed software

CME/2

Varsion 1

CME/G3

• From front page

THE 3081 Thermal Conduction Mod-ula with a section of the cooling

plete cut sway to reveal some of the 100 plus chips on the 32-layer

on the 32-layer of the tate. Two of the apring-landed heet sink pletone on the bottom edge of the aut

edge of the aut
nwsy section.
IBM says that the
more stilctent
cooling obtained.

cooling obtained with this design

Control Unit, one Store Control

Unit and two megabytes of

The performance of the 2966,

previously codeoamed S3, puls it marginally above the IBM 4341

now formally issued the company with an operation requirement ful-lowing the government's decision to invoke the single tender procurement policy before it expires at the end of the year. Ellis said the contract would be worth between £30 and £40 million tu ICL, but enmmented that it was mure important to the company in terms

ol maintaining its credibility than the actual money involved. The contract to supply the 20,000 terminals required for the COMBINATION OF OPERATING SYSTEMS IN USE UNDER CME PAYE system is not subject to the single tender palicy and will be open to bids from any potential supplier whether UK-based or foreign. But the Inland Revenue feels confldent that one or more UK-based firms will be able to

6

The total terminal business will be worth about £30 million and

utisfy its requirements, the main



EUI8 . . . The contract is more important to the company in terms of maintaining its predibility than the actual money involved.

one obvious contender, Ferranti, said that it would be offering units based on its PT7 series terminals which already come in ICL-compatible versions. It would be willing to make any hardware or software modifications to meet the specification.

The Inland Revenue plans to install four or five single processor mainframes at each of the 12 proposed regional centres. Each will aupport about 500 terminals and ICL's capability to handle this young has been carefully levents. volume has been catefully investi-

num metallisationi IBM points out that the 16 layers providing the tignal path contain a collective equivalent of more than 6000

ITo overcome cooling problems, IBM has scaled the substrate and chips into the claborate Thermal uction Module, an assembly

each chip.

The apace between the plate and substrate is filled with helium to help cooling further and to protect the devices against chemical con-

temination.
Wiring is reduced further by the boards on which the Thermal Conduction Modules are mounted.

From front page

coosisting of an outside plate embedded with cooling water chanded with cooling water chanded with ground large largest large

by cables and wires.

A significant architectural fea-ture of the 3081 is the use of a separate processor controller, the 3082. It handles unit initialisation and microcode loading and assists in hardware error recovery.

IBM has announced no new software with the 3081.

the 1900 to "migrate" up to the larger 2900 and continue to ron systems announcements accompanied ICL's launch of the 2955 and then old software on the new 2966 last week. As predicted by hardware.

This meant that the daily

CME provides 'virtual' link for

parallel operation of systems

workload could be tim as usual, with VMEB and VMEK develimment undertaken at off-peak harness, Commrrem Machine Im Redistribution vironment, now links the larger

VME systems for virtual opera-

tions to the DML Direct Machine

Environment su that DME and

DME itself was introduced

2846 2850 2855 2986

2850 2958 2968

266E

A 2950 or 2956 can be field up-graded to a 2966 by the substitu-tion of the 2966 Order Code Processor which, according to ICL, has a "significantly enhanced

performance level" compared with

the 2956 OCP, Differences include

faster emitter coupled logic, an In-

three years ago to allow users o

VME can be run in parallel.

Operating System

DME/2 DME/3 DME3/G VME/K VME/

Figure 1: The asterisks indicate which version of CME will apply to various combinations of herdware end operating system.

Now CME, alsu developed through microprugrantming, allows the user to run DME and VME worklands tugether. According to ICL, applications can be developed in the same shift, and the user can control machine resources allocated to each regime.

The inicrocude is said to be modular, so that it can be railored at lead-time in take account of in-dividual needs. As the workload shifts towards VME, resources can be redistributed by partitioning store, allocating peripherals, power, and communicating de-

vices between the two regimes.

The asterisks in fig. 1 indicate which version of CME will apply in verious combinations of hardware and operating system, For example George 3 users (whe usually show such devolion to the OS that It is hard to imagine VME getting a warm welcome in any High power upgrade by ICI

high speed slave store and the number of current page registers and a block feich mechanism that

shortens store access times. Systems software supported by the 2966 includes VMB/B, VMH/B-E,

VME/K and three versions

CME. They enver DME/2, DME/3 and DME George 3.
ICL quotes £720,000 for a 2966 with one OCP, one SCU and Iwo DCUs.

VMER-E on a 2966 using tread a careful path between midging its customers towards the lif-CME63. tormation Processing Architecture Pingiams run under VME can read and write data from 1900

DME files through the Adram facility; this entails what is promised to be "a ininor change" to JCL when a VME program accessing 2900 data follows a DME record

The entire range of applications such as DDS and IDMS, TPMS, and screen editors, are available with CMP but CME itself will not be available across the entire

machine range. Users of 2946, 2950, 2955, 2956 and 2966 will have the option open to them, but 2960 users have been left unt in the cold. ICL gives au example of pricing for the system at £530 per month for CME on a

Claire Gooding writes: An-nouncing CME allows ICl. to keep

on which its tuture plans are last and losing them completely by demanding the upheaval and loss of investment involved in converting operating systems. Bridge

140 H da 1 dd 1

In fact, CME is a hidge which allows users to perpetuate outslated batch systems which originated with DME: a concept which still supports many customers who have invested a great deal

It's good that ICL is aware of its customers' present needs as well as future mes, but the danger of providing such a bridge is that suine will dawdle on it rather than

-The versatile 'K'-

ANOTHER release of ICL' epareting system VMEK, KSV 18, tollow quick upon the heat of KSV/17, which completed field trials a month ago.

The revamped K will support

the newly-announced 2966 and is the newly-announced 2506 slid is said to incorporate new testures while building on fecilities evaluable in the ourrent version, conjustingly referred to by the catchy title VMEKSV 17.50.

The KSV18 vorsion provides support for the information Processing Architectura features such as Remota Session Access, Distributed Message Reutar, Distributed Application Facility, as well as connection to the X25 packet as connection to the X25 packet switching standard.

KSV18 also supports GME2 and Adrem 1800 and the Moduler Disc Storage System. ICL promises "exceptionally high throughput."

ICL has also introduced a nev version of the large systems OS VMEB. Called VMEB-E, it is an entry level system elmed et nev usera to provide streightforward implementation, and a simplified growth path from medium to lerge 2800 systems, leading

It is built on a meduler elructure so thal features such es transaction processing, perform-ance measurement end ac-counting cen be built into the basic system while normal operation continues. It is evali-able on strgia and dual 2900 systems; 2858, 2980, 2888, 2970, 2972, 2976, 2980 and 2982.

ICL is obviously tirmty com-mitted to IPA, and VMEB-E is enother lure to win customets for data access mechanisms sup-ported by VME which provide the loundetion for tuture de-

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NOVEMBER 25

Metring: IBM Minicomputers, acs Microprocessor Group, BCS head-quarters, 2.00.

Macting: Word Processing and Office Automation in the US, BCS Word Processing and Office Automation. Group: Prodential Assurance, Holborn Bats, London ECJ, 5.30.

Meeting, Networks and Fund Transfer, BCS Data Communications Group, BCS headquarters, 6.00.

NOVEMBER 26

Meeting, Microcomputers in health care, BCS Medical Group, Middlesex Hospital, London, Apply ic Hospital Physiciats Association, 47. Belgrave, Square, London, SWI.

Meeting. Word processing. IDPM
Gentral London branch, Massion
Room, National Liberal Club, Waltehall Place, Loadon SWL. 4,00pm.
Meeting. The Design of Distributing Alleroprocessor Systems. IEE
Computing and Control Division. IEE,
Savoy Place, London WC2R OBL
DECEMBER 1
Meeting, Computer Arts Society. Meeting, Computer Arts Society,

Mceting, Management game, IDPM Sheffield branch, Comshare Offices, Shaffield 6.30pm, NOVEMBER 26-27 Meeting, State of the Art Review, Inforech, Connaught Rooms, London, 9.00am, Tel. (0628) 35031.

NOVEMBER 27
Meeting, Word processing IDDM 7.30.
Seminar, Computer Alded Protection. BPICS. Garden House Held, Cambridge, Tel. (0279) 72354.
DBCEMBER 9
Meeting. Weather Forecasting ECS Meeting. Weather Forecasting ECS Fairfield Halls, Croydon, 7.15.

-How DP helped in the switch from

Night view of production platform FC, Highland One, in BP's Forties oilfiald in the North Sas.

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with a deep oppreciation of business.

to cope with the effects of the Irs- order confirmations and work innian crisis which has deprived the structions with the necessary docucompany of 40% of its crude oil mentation printed remotely back supplies; nationalisation of its oil at each site. Customer despatch warning; and o 100% increase in the cost of crude oil supplies from Opec countries in a period which prices, further complicating the finsucial situation.

Coping with such situations is nut just a case of juggling with numbers. Changes in the prices and availability of crude oil not only affect what is bought and only affect what is bought and sold. There is also a significant impact on the processing volumes of refinences, both those producing petrol and oil products, and those making chemicals and all of the ther derivative products; bulk shipping movements of crude oll, petrol, ctc. are affected; strategies are substantially aftered and a multitude of financial decisions have to be made.

Yet despite all this, BP's gross revenue increased last year by £5,200 million and its net income by almost £1,200 million. Effective management decision-making ob-viously forms an important part of continental associates in a format

Computer systems used within BP for accounting functions are The general ledger, associated accounting nad management in-formation systems for BP Trading ducts, such as petrol and lubrithey involve some 30 programmers and analysts in maintenance and

BP Trading's accounting systems also involve computer generated Input from many other aystems throughout the world.

BP Chemicals, for example,

have seven principal factories la the UK manufacturing chemicals and plastics such as PVC and polystyrene. The BP Chemicala owned company BXL Plastics (originally Bakelite Xylonite) has a further nine factories in Britain producing polythene and a wide range of bottles, synthetic paper etc. BP Chemicals also owns a number of other manufacturing

BP Chemicals' UK thata processing operations have three ICL.
2900 computer centres; each of which forms part of an order entry. and involcing network. A four-me-gabyte: 2972 processor at Baglan Bay in Wales forms the hub of the Bay in Wales forms the hub of the network, and the other centres include a 2946 at Barry in South Wales, linked via an R B into the 2972, and a 2956 in Hull is also about to be linked to the 2972. A major function of the network is transmission of bought ledger, sales, bank or cash information, into the 2972 installation.

Tapes

The network is in the final stages of completion and involves a trial of 11 sales, distribution and manufacturing sites throughout the UK. Seven of these are currently online, with a further four to so online by the end of this year. An average of 25,000 entries a month are handled for each site, via ICL 7502s linked to the 2972 centre.

interests in Nigeria with hardly a data, input via the 7502s online to the central accounting systems, triggers the invoicing cycle, invoices being despatched from the Baglan Bay Centre, olthough suon they will be printed online to

buyer to seller

Direct interfaces are also being developed into sales ledgers, staustics, and VAT returns. Transactions from other source systems systems such as budgeting, costing etc, are also interfaced into the main ledget systems at BP Chemi-cals. Tapes are produced for BP Trading's corparate VAT system.

Operators at the depots deal with telephoned customer orders, keying in a mnemonic on the Data-BXL Plastics also has its own point to identify the csiler, Appropriate quantities of the various UK factories linked Into an IBM 4341, and connected to an IBM grades of fuel entered as an order 3031 centre in Antwerp. This is further linked by RJEs to the are vetted by the aystem to ensure that the order is correct against the major European centres where BP typical ordering pattern of that Chemicals operates. Consolidation customer in the past. The aystem is subsequently updated with cus-tomer delivery confirmation of accounts is carried out at each stage, so that Antwerp, for against delivery tickets. the ability to control finance in such conditions, but efficient computer systems also play an imporgregate oil stocks at each depot against regular readings taken from the tanka, and will soon inte-Baglan Bay to produce a trial balgrate with a stock control and

ance, profit and losa account and interim balance sheet every tracking system of oll product movement throughout Britain. month, for all of BP Chemicals trading operations. BP Oil also has some 50 marketing distributors in the UK. Operating throughout the UK BP Oil's function is the refiging of These are independent companies oli and the manufacture and distrismaller quantities of oil products to housebolda, factories, farms etc.

depots, marketing distributors, SINCE lest year, national

movements and the rise One of BP Oil's many DP-based in Opec prices have functions is a distributed clustered network used by 38 depots, at mesnt that BP has ceesed to bs s major which BP Oil receives sales orders eeiler of crude oli and has and from which oil, petrol and rebeen forced to buy in lated products are distributed. The network consists of 14 elusters of order to supply its cus-Datapoint 6600 minis at main dctomere. Not only the pots, each linked to two or three processing turnovs of other depots with Datapoint 2200 refineries was affected: terminals. The 14 clusters are in stretegles hed to be return linked to Univac 1100 mainthought, and a int of frames at BP Oil's main computer and accounting centre. decision-meking hed to bs dans.

Vetted

This aystem is also used to ag-

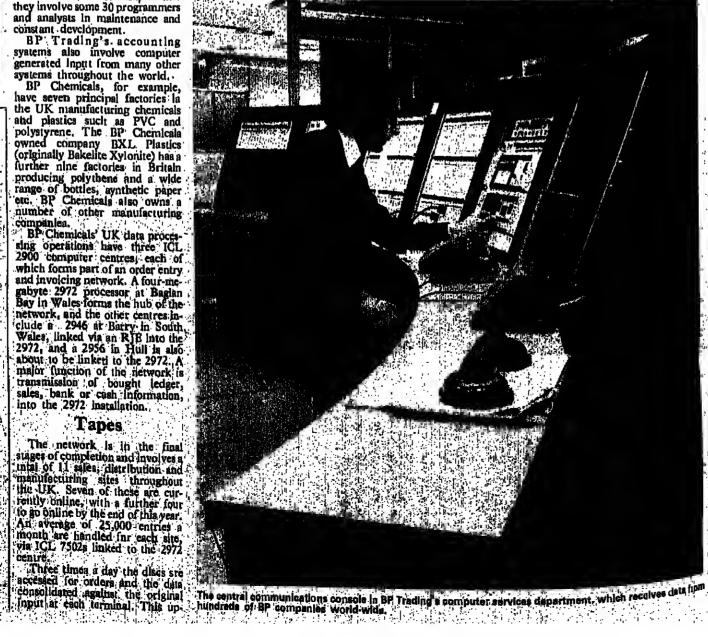
Most distributors have Ventek

BP menegement wee obviously equal to the chellenge, since the compeny meneged to increese its gross revenue by £5,200 million. But to do this, it nesded effective support from its computer eccounting systems. The third in out four-pert series describes

these finencial systems.

Datapoint 1500 terminals for day cspture and aend in floppy discs to BP Oil for the provision of an ac-counting service, including the production of customer statements of account. The development of a new enhanced system giving the marketing distributors order cap-ture, invoice production and loal online interrogation facilities, elc,

Turn to page 15



Controlling finances



improve cash flow, are also the user. systems such as those for BP Oil's accounts staff which have their own VDUs 10 update customer payments in real time. Such systems are essential as BP Oil is producing 4,000-5,000 invoices a day involving £11-12 million.

Like BP Chemicala, BP Oil also

produces computer formatted con-solidated group accounts, which form part of the accounting information input required to input event. produce the consolidated group ac-counts for BP overall. Such accaunting data from the hundreds af BP companies world-wide is re-ceived by BP 'frading's own central computer department, either input by telex as a direct link into a PDP-11/34 used as a reception system, or received as a tape consumption. taining accounts data.

In addition, input is required from systems run by BP Trading far its own world-wide operations. Therefare, many accounting related systems as well as the general systems are run on the three Univac 1100 mainframes operated by BP Trading's computer services

Typical of these is an international marketing data espeture and processing system for avistion fuel and a similar system for marine supply of marine fuel are International business operations controlled and invoiced by BP Trading, and systems were therefore designed to provide ra-pld validation and transmission of delivery data from remote sites around the world to BP Trading's

central computer facility. At the fifty or so large marketing sites at major airports, docks, etc, BP has installed ICL 1500 systems to collect and transmit the information on deliveries. The data is transmitted daily by remote oatch communications to the PDP-11 reception system (in the case of smaller sites, by telex into

Once a day, data from the PDP-is passed to the Univac processors for automatic invoicing. While, at the moment, these invoices are mailed by BP Trading, an investigation is currently taking place into means by which telex invoices may be geocrated and sent out automatically via the PDP-11.

As well as automatic prioing

systems, payrolls run as databases and so on, there are a number of transaction accounting systems, run by BP Trading, handling such hems as foreign payments. There hystem for petty cash, travelling, expenditure, based on an ICL

Polled

slot or series of slots containing a puter and manual systems. ille name and checked against a
master file reference system. All
missier files are constantly polled every
more and manual systems.
A probable future development
will be to link the system online
the files are constantly polled every
into other financial computing
division.

day on an exception basis, for imancial information that has not yet been accessed.
Validation is carried out automatically (the validation program bankers computer systems, which seekes up 64K words heavily would enable it to make payments overlaid to a total of 200K), using the bank's computer facilities. Such moves indicate that soon allocated in batches on a company organisations such as BP may also by company, and currents by company.

Of approximately 3,000,000 records that are input to the ledger From page 14

Behind such moves, designed to Behind such moves, designed to the leader systems, while the remaining 10% will soon be input at transaction level via the ICL 2903, thus putting validation and data entry into the hands of the leader systems, while the remaining 10% will soon be input at transaction level via the ICL 2903, thus putting validation and data entry into the hands of

> To assist user departments, the ledger systems include a bespoke report generator using a large data just for accounts biii for all user departments including computer operations themselves (so that they can specify and schedule work en-

ing must be closed no one date and avintion invoicing on another. The date defined by accounts.

FIMS is BP Trading's financia designed to provide actual income quarter. It is being developed to ledgers and integrated MIS include oil estimates which will provide financial forecasts and enable comparisons with actuals.

The main computer functions o the aystem are; data collection; the control of data between FIMS and the general ledger system; a re-pricing facility; the maintenance of the FIMS databose; the selection of data and its manipulation for reports; and the production of

BP Trading's sinance department's activities involve invest menta in the inter-bank market lu London, and foreign exchange deals in the London market — it bandles almost as much l'oreign exchange, investment and cash as some of the major clearing-banks. 1000 based system to aid control of all day-to-day cash bandling, and this acta as a treasury for all BP companies throughout the UK who call up their cash requirements or make available cash sur pluses each day.

At a given time the cash ranges substantially, although monthly turnover averages the equivolent of £1,250,000,000 with holdings in terms of bank investments, local authority loans or short-term investments running at times over the £1,000 million level. Such sums can justify a dedicated system which was specified and developed as an online interactive system. Three aress are hondled by the system; foreign exchange

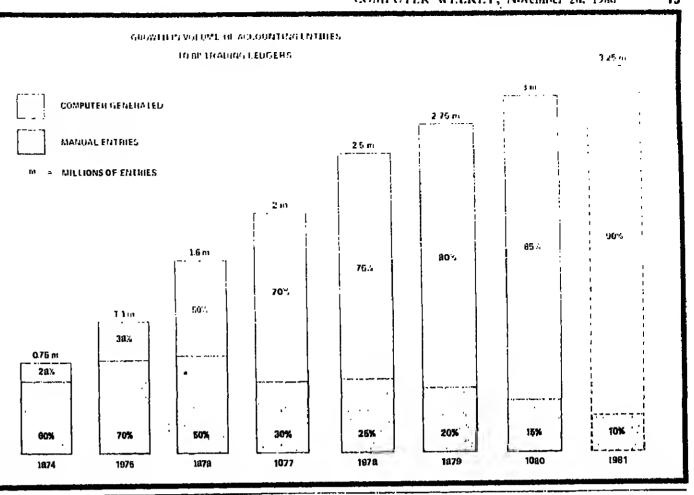
investments and borrowings.

The financial director of BP
Trading, Q. M. Morris, also has a
VDU linked into the system, so that at any time he can access the cash and banking situation

The accounting key in BP Tradoverall pleture of the cash flow of mg is the general ledger system, which handles 15,000 updato technic of the main trading ledgers at the same time enabling individual aspects of cash to be looked at in detail. At the moment, input is manual, based on output information generated by other complete of alors containing a superson of the cash flow of the system is used to present an overall pleture of the cash flow of BP Trading and other subsidiaries, at the same time enabling individual aspects of cash to be looked at in detail. At the moment, input is manual, based on output information generated by other complete the cash flow of BP Trading and other subsidiaries, at the same time enabling individual aspects of cash to be looked at in detail. At the moment, input is manual, based on output information generated by other complete the cash flow of BP Trading and other subsidiaries, at the same time enabling individual aspects of cash to be looked at in detail. At the moment, input is manual, based on output information generated by other complete the cash flow of BP Trading and other subsidiaries, at the same time enabling individual aspects of cash to be looked at in detail. At the moment, input is manual, based on output information generated by other complete the cash flow of th

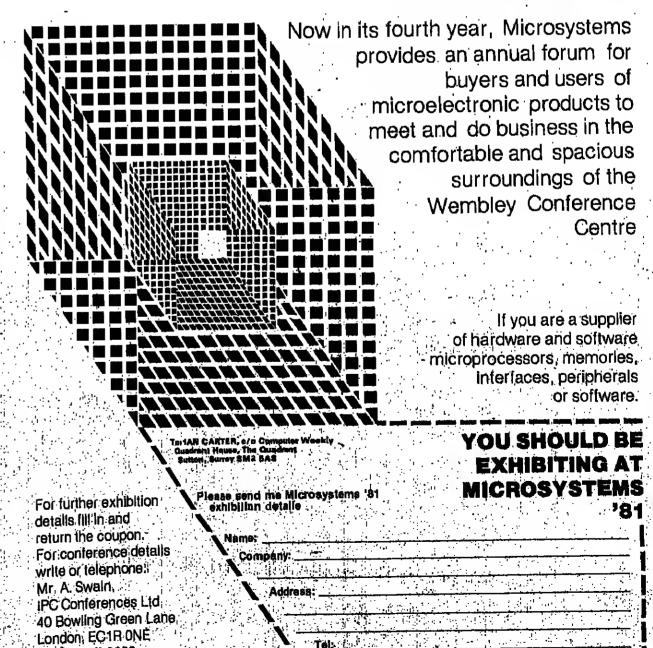
systems in the UK. Payments that the department makes may also change, for BP is considering using the VDUs to input data into its amocated in batches on a company by company, and currency by curtificity basis. Input is also established by date references so that at the chid of each day a complete trial balance can be run with the total of all ledgers by company and by curtificity, which is expected always to pet a zero balance.

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by Rosemary Rock-Evans Section I — Part 8

of our series describing a systems development methodology

the two main phases of data analysis – functional analysis and concept, that of attribute types, programs. will be described

Attribute types are determined during both entity analysis and functional analysis; they are also Attribute Type quence upon, buth of these stages.

THIS series has now introduced changes in the entity model. Attribute types form the basis for the dam items/fields which will cutity analysis. In this part, a new be used in the database and

Attribute Types

An attribute is a descriptive lo the next stricle it will be seen, property or value associated with for instance, how the study of an entity. Thus an attribute type is some attribute types can result in: the collection of all values of a de-

Entity type Attribute type Attribute John Smith Date of Birth 28.7.50 Current Annuel Salary£10,000 289 High Holborn Address

No of Floors Realstretion

Yeer Registered Colour

LSM 935 1931 8 entley

Figure 1. Altributes and attribute lypes.

Attribute type Entity Dete of birth of patient Date of death of petient Date hospitel founded Current budget of hospital (.000£a) Total time taken for operation in minutes Successful/unsuccessful indicator

> Type of doctor la.g. surgeon, aneesthetist, consultant etci

Dete of birth of doctor

Floura 2. 6ado attributo lypes.

Attribute types DATA ANALYSIS — properties of the entity type

cutities of a given entity type.

A simple example of attributes

and attribute types is given in Figure 1. Each attribut type in the xample is describing some quality 1. Primary, or Basic. The hasic order to carry out the functions of the business. They eannot be de-duced or calculsted from other attributes and must be collected during some business activity.

For example, the function 'Patient registers with Hospital' may result in the sex of the patient and date of birth of the patient heing collected. "Death of Patient" will result in the date of death being available. Figure 2 gives examples of some

hasie stribute types which might be expected in the hospiral example we have been using.

2. Secondary, or derived. These are generated from other attributes, as a result of the functions of the business. Note that we are

not concerned at this stage shout whether the sttribute types have any permanence, ie, these attri-bute types may be stored on the database or they may just form the working storage of a program. The interest is in their existence and

Some examples of derived attrlbutes are given in Figure 3. The number of days the patient has been in hospital, for example, may be calculated by subtracting from the current date or date the patient was discharged, the date the per-son was admitted to the hospital. It can be seen that the primary

attribute types, as they are not in-fluenced by the functions of the during entity analysis, even many of the secondary stribute types, however, will be dependent upon the results of functional

Within the primary attribute types, a further type of sttribute exists which is of especial importauce to analysis and systems design - that of the "key" or entity identifier. A key ia the means by which an entity is uniquely identified; by which each cotity of s iven type can be distinguished from all others of that type. A key is really a design consideration, in that it is the mesns by which dats about the entity can be retrieved. An identifier is inherent in the meaning of the entity. The analyst should not define an entity type if it is not possible uniquely to distinguish its entity occurrences.

Identifiers

The following methods esn be used to identify entities. 1. Attributes of the entity. The value(s) of an attribute type or types which describe the entity type msy be used to identify an entity. If one attribute type is used, the identifier is termed "simple". If more than one attribute type is used it is termed composite". An example is given

in Figure 4.
2. Attributes identifying other. entity types. The identifiers of entities of one or more types may be used to identify another entity. Identifiers of this category are called "foreign". If the identifier of only one entity is used to idenify another entity then the latter key must be made unique by using

further sttributes of its own.

It is possible, however, to identify an entity uniquely, using only

Figure 3. Derived attribute lypes.

Attribute type

at operation

left i,000£s)

Identifier

Clinic no and clinic

wing no and floor no

district gode

Total no of days in hospital

No of doctors elloceted to operation

No of doctors ectually ettendent

No of nurses actuelly attendent

Total emount of current budget

National Health Service Simple

Composite

Composite

tity type

Entity type

Operation

Clinic

Examples of these two esses are given in Figure 5.

Often system designers may already have invented keys for the the job of the snalyst to choose an identifier, the one major rule which must be followed, whichever type of key is chosen, Is that the values of the attribute types chosen must not vary over time. If this rule is not followed the entity will not ba identified can result. In general, foreign attributes

are used as identifiera where the entity type only exists because other entity types exist; an operation cannot exist without a patient, a clinic session cannot exist with out a clinic. In effect it is the operation's membership of a specific "Patient is Operated on" relationship, which is used in part to Identify the operation. It is not valid to identify an entity type with the identifier of another entity type f the one is not dependent for ta existence on the other (ie if the relationship is optional) because, if one does not exist, the other cannot be identified. For instance, if patients were given an identifier which depended on the first appointment they had had, it would not be possible to refer to a patient wbo had no appointment

Note that where the existence of an entity type is totally dependent on the existence of other entity types - for instance, a clinic ses sion cannot exist without the elinie

Patient | **Patient** medication Drug

- this can be represented on the entity model by the use of a stroke across the relationship line be tween the two or more entity types, see Figure 6. Note also that although the entity type is dependent for its existence on the xistence of a patient, and a drug the attribute types used to identif the patient medication need not necessarily be the identifier of each of these entity types. An entity type of this kind known as an "Intersection" entity type.

laure 6. Intersection entity type

Determination of attribute types

The determination of stribute types uses the rules for data analysis which state the restric-tions within which analysis must take place (the parallel with language is shown in brackets): 1. Each notion in the environmen

must be classified as either one entity (noun or noun phrase) or 26 attribute of one antity (adjective ar adjectival phrase) or a relationship between entities (verb or verb phrase); each element should be classified in only one way.

2. Only entities have attributes

(only nouna have adjectives).

3. Only entities bave relations (verbs can only describe the

Connection between nouns).
One further rule may help in the determination of attributes; 4. An entity can have only ent bute type, ie if Jim Brown was a entity within the Patient entity type, it would be invalid to have an attribute type of Height with two
values 5ft 8in and 6ft 0in.
The contents of clerical files,

forms, letters and reports, the to-sults of functional analysis and the results of decision analysis and reveal relevant attribute types.

All the basic rules for determining

ing attribute types will be given in Part 9, since it is best to discuss the determination of attribute types while also discussing the problems which can result.

The definition of attribute types and the results.

and the two types, primary of basic, and secondary or derived, have been described, and the use of attributes to identify entities. Part 9 will cover the determin

Thorn TV Rentals has more than three counting queries. An alternative acmillion customers. When longer end counting system was sought, and longer postal deleys caused overdue re- telecoms was the obvious answer. Here minders to cross with peyments, 85% of LAURA TATHAM describes the trensition its correspondence was composed of ac- to the new regime.

Tightening up on rental accounting

telephone network and Thorn

work to British Telecom DCE

autodialling equipment at the re-

gional centres.
At each centre the V77/200 feeds

its branch telephone numbers to s

bank of DCE is, and these units

go to the next branch number in

ever placed for the DCE 1 units and Rumsey spoke highly of the

service provided by British

Telecom - or Post Office as it wa

when the project was initiated

There was a very early deadline for

delivery and also some administra-

tive reorganisation of one of the rental company's commercia

This altered the requirement for

with everything and gave us mar-vellous support," ssys Rumsay. One of the most remarkable fea-

tures of the system is that every PoS terminal in all showrooms can be reprogrammed remotely from the central V77/600 in Swindon.

This is done by using the commu

ications network in the reverse of

the normal direction to transmit a long, very complex algorithm de-

veloped by the Thorn team.

A successful live exercise usin

this facility proved that it climi

ustes the delays and disruption

as alterations in VAT.

that can be caused by changes such

When auch a change is an-nounced, it is necessary to imple-ment the new VAT rate immedi-

ately. Formerly this was no possible, and consequently the

eompany had to bear the cost of the extra tax until cuatomera

payment books had been updated

tala directiy a tax variadon comes

effect easily and without delay

after customers have been in-

formed that such ehanges are

Excellent

Now, it is possible to adjust ren-

The Thorn order is the larges

A TELECOMS network that will improve the servicing of customer control of the monics paid each day into its showrooms has been brought into uperation by Thorn TV Rentals, one of the UK's largest groups renting domestie televisions, viewdata sets and

Thorn TV Rentsls is the parent company and eentral accounting unit for Radio Rentsls (1.75 mdlion customers), DER (I million) and Multibroadcast (350,000). The group hos more than 1,000 showrooms throughout the country, where customers can see the televisions available for rent, sign contracts and buy accessories such as video tapes. They can also pay their weekly, monthly or quarterly

Under the previous regime, de-tails of such payments were mailed the response is a ringing tone or engaged signsl, persist until a connection is made and, on com-pletion of the call, elest down and from the showrooms to each of 13 area accounts offices, where the data was prepared for onward transmission to Swindon. It was because of long postal delays that it was decided to develop, the new

factorily on the whole," says director Bob Rumsey, "but when as much as five days passed before data reached us, we began to get very worried.

Irritated

"Our ICL mainframe issues reminders to engtomers whose payments are overdue, and with of these reminders went to people who had already paid sometimes several days earlier. Understandably, many got very ir-ritsted. In foct, at that time, about 85% of all the correspondence we handled was in connection with queries on accounts.

"So we began to look for an alternstive that would solve the problem once and for all. Aside from improving our service to customers, wa wanted a system that could cope with new spplice-

Telecommunications was the obvious answer. The big question was what shape the new system

There was, Rumsey recollects, no-one to turn to for first-hand advice, since no organisation had yet pecked a problem of this scale and complexity. So Thorn carried out its own satudy....

The resulting system is notable, into force. Rent reductions or in-creases can also be brought into not only for its novelty, efficiency and coat-effectiveness, but also for remarkably rapid implementation. Because Thorn's broad criterium was excellence in each of several

was excellence in each of several areas of expertise, its system is "hized", involving the equipment of several suppliers.

Heart of the network is a Univac V77/600 minicomputer at Swindon, which is linked by dedicated 4,800-bps lines to 13 regional accounting centres; each of which has a Y77/200 mini;

Thorn selected the Univac V77 minis because we were impressed Software for the Univac V77s was written by Detwiler Thomas and Aasocistes. "They were very co-operative and did an excellent job for us," is Bob Rumsey's verdict Software for the PoS terminates. dict. Software for the PoS termi-

minis because we were impressed in all was developed jointly by with this manufacturer's expertise. Thorn and Data Termical Thorn and Data Termical Systems.

In commonications and with the Systems.

Performance of these minis asya branch offices are recorded and that to have the right capacity and complete reliability when we were developing such an extensive permanance pad, colour coded and numeric pad, colour coded and

work.

Univac's legibility to system de labelled transaction keys and a labelled transaction k

The regional centres each collect data nn disc from about 100 showrooms which are equipped with The terminal also includes an point-of-sale terminals, purpose designed by Data Terminal Systems. "DTS was one of the few companies that were prepared to eater for our special requirements at a competitive price," says Rumbook is then inserted into the terat a competitive price," says Kumminal for details of payments to be Largest order

All transaction details are held There are about 1,200 of these in the PoS units memory for on-PoS terminals in the system, ward transmission to the regional linked via modema over the public centre in the evening.

ing 8 disc containing the program and appropriate telephone

In readiness for this operation the hranch terminal is set to the

'transmit made" at close of luisiness. When transmission has been successful, a tick is displayed on the plasma screen. If for some reason transmission does not take place, a coded display indicates the

centre in the evening.

At precisely 18.01 hours each dsy (one minute after cheap rates

COMPUTER WEEKLY, November 20, 1980

At each of 13 regional accounting centres in the Thero TV Rental network there is a Univec V77/200 milor leadtre) linked via a bank of British Telecom DCE1 line equipment to up to 100 branch showrooms. The centre shown here is at DER's headquerters at Fetham, Middlesex, where each of 10 DCE 1s and their related moderns handle data from up to 10 branches. The operator on the left is using the VDU and printer to

reconciliation and analysis.

Data frum all 13 regional offices V77/600 which also curries out reconciliation, crosolidation and printing. This operation provides senior manogement with a nationwide picture of the day's

Finally, the raw data on disc is written to ICL-compatible tape for hatch updating of enstoner ac-counts by the ICL 1900 mainframe during the night. (This is shortly to be upgraded to a 2972.)

Thorn TV Reotals' new system

has successfuly achieved its Rumsey is curvinced it has only scratched the surface of its poten tini for yieldring manageorem i existing inhouse viewdata system.

Already an international system f accounting on similar lines is being itoplemented, also hased on Univac V77 minis. Soon connterparts will be operating for several European and Nordie countries and in the Republic of Ireland.

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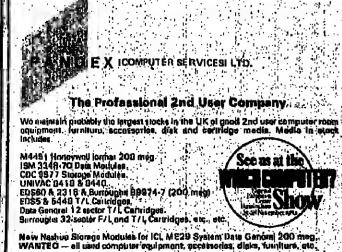
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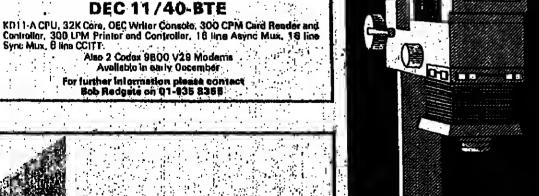
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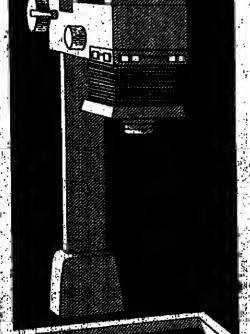
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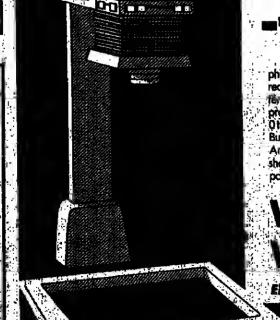
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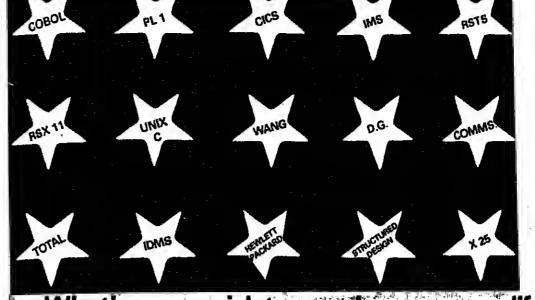
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the industry today. Their continuing growth, reputation and success

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A vary major IBM Service Sureau, part of a multi-national organisation is looking for a presentable, varbal profasalonal able to conduct sales courses and demonstrations to cliants. Past axparience ahould include COBOL, FORTRAN or PLIm under OS with JCL knowledge would be an added advantage, Absolutely auper perks and prospects look axcellent. CW47/1 Michso

IBM Systems Programmers

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BENEFITS New Zealand offers a quality of life that is sought after by many, more specifically Feltex offers: o Top New Zealand salaries o Stimulating career challenge o Re-location expenses on permanent employment o Return air fare on contract assignments.

Final interviews will be conducted by the Group Data Processing Manager in the week commencing 8 December. In the first instance however, please telephone Chad Stolper of Prescot Computers Limited on (01) 434 2698/9. If you prefer write to him at:

> Prescot Computers Limited 43 Conduit Street London WIR 9FB

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Ear more information telephone Ain King TANGENT COMPUTER SERVICES Rontford, Essex Tel: Romford 750201

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We have been retained by a foremost systems house, to assist in the retroitment of a number of high calibre technicians, each of whom must have a unnimm of 2 years working on real time software design and implementation. Additioned experience of multi-processor system are hitecture, communications network and micro-based distributed data-lase would be extremely useful. A unique nuxture of small-team involvement within a technically advanced environment — the best of both worlds. Contact: Margaret Stevens

Senior Analyst/Programmers to c.£11,000 + benefits Dublin

An established systems house operating throughout the republic from the Dublin office entrently have urgent need to strengthen their project teams. Working mainly on linancial systems on IBM hardware you will be responsible for assessing elient requirements, designing, programming and implementing the specific systems and be

requirements, nesigning, programming and implementing the specific systems and be involved with all aspects of enstoner support. It is essential that applicants have sound commercial analysis knowledge with several years COBOL and DLL as well as good experience of a CICS system. You count also display the ability to communicate it all levels and be prepared to travel when required. A negligible salary is available plus expenses, an immal bours and relocation to the stall condign. Contact: Brian Postles

System Programmer

Essex This is an excellent opportunity bejoin a well established organisation, who are alming to provide efficient and reliable systems to user departments. If is essential to have a sound IBM background with a minimum of one years experience of DOS/VSE and extensive knowledge of CICS. Responsibilities will cover, advice and investigation on the use of new software. Introduction of enhancements and diagnosis of operational

problems.
The company offer good current development and rewards are given on the basis of Individual results achieved.

Contact: Janet Chilvers

Programming Team Leaders

Our Client, an International Shipping organisation which is embarking on a major programme of new applications development, is seeking two Sentor Programmers to

programme on new applications.
It is essential to have at least four years programming experience, consisting of two
It is essential to have at least four years programming experience, consisting of two
years on IBM mainframes using COBOL with extensive knowledge of OS/JCL. The
years on IBM mainframes using COBOL with extensive knowledge of OS/JCL. The
ability to write programme specifications and modularizations is of prime importance.
Contact: Isobel Bruce

Technical Support Analyst Hampshire

Our Client, a professional and well catablished service organisation are looking for an experienced ICL 2900 person to join their support team. It is essential to have four years data processing experience, with 2 years COBOL and 12 months practical knowledge of the facilities of VMW/B., systems design and IDMS. The ability to communicate well is essential.

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support team.

A minimum of two years on-line programming experience, preferably gained in a minimum of two years on-line programming experience, preferably gained in a minimum of two years on-line programming experience, preferably gained in a minimum of two years on line programming experience, preferably gained in a minimum of two years on line programming experience, preferably gained in a minimum of two years on line programming experience, preferably gained in a minimum of two years on line programming experience, preferably gained in a minimum of two years on line programming experience, preferably gained in a minimum of two years on line programming experience.

with a sound on-line programming background.

Training facilities and career prospecta are execulent as this organisation firmly support promotion from within.

Contact: Isobel Bruce

Analyst/Programmer South Coast

We have been relained by one of the most progressive manufacturing companies based on the South Coast, to recruit for them an additional Analysi/Programmer who will have to provide maintenance support to existing systems. In both programming and analysis areas. They are currently running on IBM 370/138 utilising TOTAL in an area.

Candidates will be expected to hove at least two years knowledge of COBOL, compled

with exposure to systems design. It is desirable to have a manufacturing background gained on IBM kit, although this is not essential. Applicants must be able to work under their own initialive and be able to grasp new concepts easily. Full relocation costs, together with altractive fringe benefits. completes an attractive package.

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c.£6,500 Kent A well established international organisation has a vacancy for a Programmer in Julii in team developing enumerical applications.

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Installation next year.

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Contact: Jim Baker

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Rhineland Germany: Salary 14K

outstanding natural beauty and within three hours' drive of six neighbouring countries!! It is essential that all applicants have a minimum of 2 years' COBOL. Assembler or l'i.-1 programming experience although the hardware involvement is irrelevant, since excellent in-

A German Chemical and Pharmaceutical Company has requested LOGISTIX to identify and recruit Applications Programmers and Analyst/Programmers for its recently upgraded IBM installations. The Company is situated in an area of the company is situated in the company is situated.

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Beds/Cambs.: Salary to £10K

computer or micro-processor. These positions will appeal equally to those with

Our client is a highly respected Systems and Software Supplier liaving its Research and Development Faellity in a most attractive East Anglian location. Current requirements ere fur Davelopment Programmers offering a minimum of is months' Basic or Assemblar programming experience on any minimum computer or micro-processor. These efits represent an outstanding oppor-tunity for those keen to participate in "state-of-the-art" software and firmware

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an excellent contract raic, occommudaan excellent contract raic, occommoda-tion and trovelling expenses will be paid. Initial interviews will be held within seven days of the appearance of this advertisement. Late 1980/early 1981 start dates are enviseged. Ref. L/47/C

S/W Designers & Engineers

Swindon: Salary to £11.5K

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One of Europe's leading communications sales support, whilst others demand a knowledge of not only software but also firmware development techniques. Of porticular interest will be those cancessful applicants will heve 2-3 years' mini-computer or microprocessor Assembler experience. Some positiona require active and regular pro- and post-

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spplicants will be involved in pre-sales packages and training customer person-nel through the madium of seminars and video demonstrations. Candidatae should

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ambitious anginaers with en in-depth knowledge of Electronic Engineering and Micropracessor techniques. Software Support Programmers should offer of least 18 months BASIC or PASCAL procreated vacancies for edditional milers.

Service Engineers and Softwore Support gramming experience on any leading mile or inlero computer. Interest in Personal computing will be a distinct advantage, herdware end software support. As o Micro Service Engineer you will support monstrate the ability to lielse with customers and solve any problems which computer systems and terminal products.

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The people who ask What recession?'

and more data processing prolance, successfully selling their talents in an open mar-ket, a trend that is being followed by accountants, engiueers and even senior namagement in industry.
Until recently, freelancing

was frowned upon and the supply of external resources to computer users was the province of software houses, offering permanent staff on a

ume and materials basia.
This changed radically when agencies were formed specifically to bandle the affairs of independent contrac-tors. The software houses liave found is progresssively more difficult to compete ever

now dropped out of this marketplace completely, concen-trating on in-house project work, unable to match the agencies on the price and

aide of the equation. What are sum very much in deabout demand?

Although minor geographical differences do cxist, the general philosophy of users contractora placed by my throughout the UK is that company recently have moved to a third party, via a Cv mat does you justice. It is disconcerting to receive a badly laid out single page career summary from someone claiming many years' experience.

Freelancing in the DP industry is becoming in-creasingly populer. Not surprising when demend is an high that contractors are esking "What reces-alon?" VIC GROVES discusses this situation and offers some edvice to would-be independent DP professionels. Groves hes spent severel yeers in the computer industry: In 1975 he set up his own company, Quadrent Computer Services, which soon became e loading UK software house. In 1978 ha laft the meinstraem of the eoftwere industry to develop a secure morket place for fresisneers, with the esteblishment of VNG Professional Servicee

computerisation will help their companies out of recession. Redundancies may be taking place in other departments, but contract staff are still required within data processing.

In a station will help into leading edge development work. One first-timer made his first job move for ten years!

But, if you are a contract now or for much longer, or If you are a

processing.

In addition, companies breaking new technical ground are usually prepared to buy expertise. Enforced situations such as hardware aituations such as hardware auch long-term security and changes mean that many comhigh job satisfaction. panies have no choice but tu supplement resources, and the demand from overseas has never been higher.

Philosophy

But this is on the supply side of the equation. What about demand. Contract length is on the supply supply so that your skills and strengths are represented are still very much in demand. Contract length is on the supply so that your skills and strengths are represented to a third party, via a CV that to a third party, via a CV that the supply so that your skills and strengths are represented to a third party, via a CV that the supply supply so that your skills and strengths are represented to a third party, via a CV that the supply supply so that your skills and strengths are represented to a third party, via a CV that the supply supply so that your skills and strengths are represented the supply supply so that your skills and strengths are represented to a third party, via a CV that the supply supply so that your skills and strengths are represented to a third party, via a CV that the supply supply supply so that your skills and strengths are represented to a third party, via a CV that the supply suppl First, prepare yourself

Register

Secondly, register young with two or three agence that really know the business, in which you can trust, and have confidence.

If you are a first-time there is another maller to kel at before registering. Evab lish what advice and guidance is available on how to set up limited company, and so ca - a booklei, perhaps? Now let's look at the

future. The recession is causng a shortage of work in co. ain arcas, appravated b some contractors having limited skills and not being prepared to travel, or more to where the work is. However centres of the UK, exper-

When the recession works through, the demand for new avstems must jocresse further and the current shortage of DP staff will get worse (or better, depending on which way you look at it). It is fair to predict that 1981 will see a significant increase in deman for contract staff.

My company's order book has never been fuller and se requently find ourselves asking the question "What ie-

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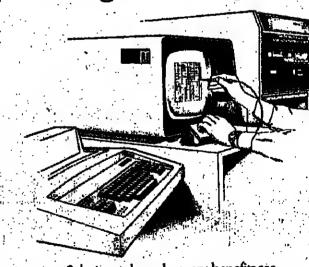
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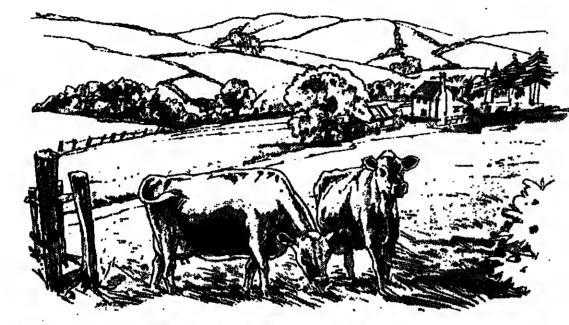
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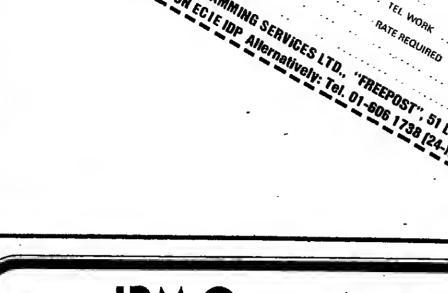
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Demand

There is an identifiable line

egers. Thereafter there is an

exponential decrease in de-

mand fur one's services up to

die level of Ruler of the Uni-

salesmen, within the compu-

Gossip

In this kind of situation

also the hexard of becoming

the victim of the industry

A manager thinking of a job

It really was most enjoyable. We even got some busi-

One of the people I met was in a sales career up to which a man who had come to me the chances for further emor a management job source playment increase, and bethree years ago. He was althree years and. He was already an experienced sales cline. From the sales trainee manager at their line and to the senior salesman, there wented a similar role with is an increasing demand for is an increasing demand for some other company. Unforune's services as one's selling tunately, and as is usually the case, there were no sunable opportunities available.

However, he was under mains static. The computer

some pressure to move at the industry is probably short of time, so I suggested he took a over 1,000 cumpetent senior seles jub within what selestren was likely to be an expanding Whereas the first hint of situation. This would provide the title "manager" produces a significant drop in demand. rotum to management de-pending on the success of both the total operation and in the case of account mon-

High earnings

I am pleased to report that he now manages e successful
operation of same 11 people
all recruited by himself
salesmen, within the compuall recruited by himself working within a business he built up by his own efforts. His carnings are high and he is enjoying his job. As you might imagine, he is very pleased he made the move, even though he was a little opprehensive about the risks ales managers typically at the time.

at the time.
This conversation led me to cennot offord to burn their boats. It is noually more senthinking ebout the many sible to adopt a Micewberish other minnagers I meet during estimate of seeing when turns the course of a year who are considering a change of inb or heve hed e change of employment thrust upon them. one printing example of the mess contacts.

"There are elways plenty of job opportunities at menagement level until you want

The reality is o function of the hierarchical pyramid created by the typical manogenient structure. The higher up you go, the nerrower it gets. The most difficult person to re-employ is a managing director who wishes to do the same iob somewhere to do the seme job somewhere

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The University has access to vary powerful computing facilities and i wide rongs of different mechanicant architecture. The applicate will be expected to give advice on the attability of different aumorica methods for the various competer systems available. He has will be superially concerned with the autority concerned with the autority concerned with the autority concerned with the autority as vector and as my processors.

Applicants should normally possess a post-graduate qualification is numerical methods or a first degree with a lega-perience of numerical energy as sonthing of numerical sonthingues to practical problems in highly degrable

Catory will be within Range 18/1A £4795 £9595 p.s. Statting pole

and addresses of two remains an addresses and the Mr. P. Voughan-Bmith, Brasfing Opportment, The University, Southernotor SOE SNH, Irom whom further deligits can be obtained. Please quote ref. 1170/A/CW.

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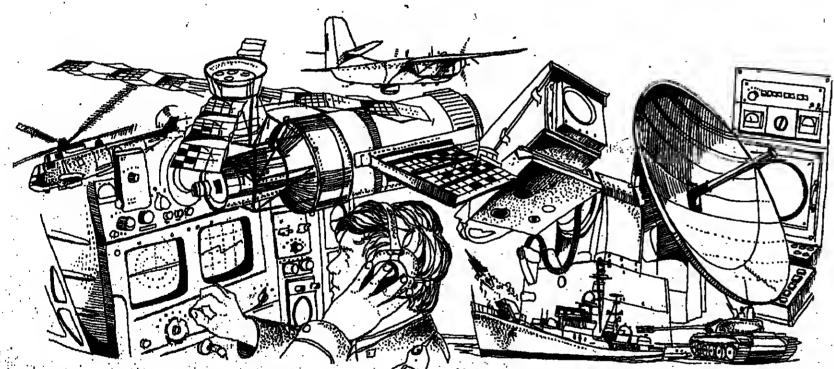
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The Centro operates en ICL 1904S computer running under the GEORGE 3 operating system and plans are in hand to install ICL 2900 equipment in the

Applications are invited for the following posts: -

INTERMEDIATE SYSTEMS **DESIGNER**

(APPLICATIONS) (REF. 78) STARTING SALARY £7134 RISING TO £8781 The Authority is seeking an experienced Computer Systems Designor to

Applicants should have a sound educational background together with 3 years or more practical design experience and a total of at least 5 years computing experience. Formal systems training would be preferred.

BASIC SYSTEMS DESIGNER

STARTING SALARY £8312 RISING TO £7694

This post although covering the same type of applications would be at a lower level and the requirements are for similarly aducated people as above with 2 years design experience end not less than 3 years practicel computing experience. Formal eyetams training would be preterred.

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